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Planting Prospects in the Philippines

THE fact that there are differences between General Wood and a very considerable number of influential Filipinos is apparent. Wherever the fault lies, the warring parties, in the interest of commercial progress, should declare a truce and get together in amity. At all events, the Filipinos seem to be trying to get laws passed that will allow rubber planters to operate as safely and profitably as in the British and Dutch possessions.

One suggestion that is being considered for quick action is that they are to be allowed the free use of public land for rubber plantations up to 20,000 hectares in extent under a 20-year lease from the Bureau of Forestry and no charges of any nature to be collected for the use of this land until the money invested has been recovered, after which the usual forest charges of 10 per cent of the value of crude product, which in this case is latex, at the place of collection, similar to the forest charges from gutta percha, rattan, etc., will be collected.

The planting of rubber will be of tremendous value to the government as it will be considered as reforestation, or reafforestation, and the potential benefit derived in the control of water, destruction by erosion, and of converting cogon lands which are breeding places of locusts, will more than compensate for the loss in land taxes and fees.

A law that will allow 25-year lease and 25-year renewal, with possible additional 25 years, giving 75 years total, is now under consideration. Thus, planters would not be taxed for at least 25 years and the only tax will be an assessment on the cost of the latex and only 10 per cent of that, which, when figured out, will be much cheaper than they are paying now in Sumatra and British North Borneo. Finally, the plantation reverts to the government after the specified period; then it will be opened to licensees, and no doubt the company operating will be given preference.

In this connection, may we politely contradict certain recent newspaper articles condemning Philippine Hevea as not only misleading but untruthful. For example, the statement that "rubber grown there is inferior to Hevea grown elsewhere," is nonsense. So, too, is the talk about ten-cent labor anywhere in the rubber countries, for no such low wages are paid. Furthermore, the claim that "America can not artificially acquire natural resources that she does not possess" is profoundly silly. Hevea now in Ceylon, in the Federated Malay States, in Sumatra, was not one of their "natural resources" and was "artificially acquired."

With thousands of square miles of tropical land, as rich as any in the world, hundreds of miles south of the typhoon belt, with a rainfall that is ideal, and a climate almost identical with that of the lower Amazon, it is certain that Hevea will flourish in the Philippines.

The factor that gives pause is safety. What guarantee can any one, American or Filipino, give that investors would enjoy the same sort of protection, and freedom from governmental meddling, that have made the British and Dutch plantations so successful?

It will be recalled that in the survey of the southern

Warren G. Harding

TWENTY-NINTH PRESIDENT OF THE UNITED STATES

Born November 2, 1865. Died August 2, 1923.

"Be thou faithful unto death, and I will give thee a crown of life."—Revelation 2: 10.

Philippine Islands, made by the Editor of the INDIA RUBBER WORLD in 1916, it was definitely established that Hevea rubber could there be successfully grown. The Basilan plantations were producing as abundantly and cheaply as any in the world. It was also found that there were approximately 10,000 square miles of land wonderfully adapted for such cultivation. All of this was corroborated by American governmental reports that may be seen by any seeking the truth, at the Bureau of Insular Affairs at Washington.

For Uniform Scientific Symbols

JUST as in old-time sectarian debates more time was often consumed in disputing terminology than in discussion of basic questions in controversy, so in modern engineering, scientific, and other technical fields a great deal of time is wasted, not so much in dealing with concrete, practical problems as in settling disputes arising from the misuse or misunderstanding of symbols and abbreviations used for technical terms. Of necessity these must be forever growing in number and variety; but so long as one symbol or abbreviation is used for several different terms while several dissimilar symbols and abbreviations are employed for only one term it is hard to avoid lapses into "confusion worse confounded" and incidentally sacrificing valuable time.

Excellent progress is being made by rubber and other manufacturers in standardizing products and processes, and every argument that applies in that direction may be used with equal force for the systematic arrangement and precise definition of technical symbols and abbreviations. There is no reason why there should not be international uniformity in this regard as there is in the nomenclature of botany and chemistry; and it should not be difficult to establish a cooperative body such as astronomers have to deal with such questions, and whose decisions, like those of the French Academy functioning in another field, would have a weight and finality which could scarcely be ignored, much less misinterpreted.

The need of such a reform was strikingly demonstrated at a recent conference of engineers, scientists, government officials, business paper editors, and industrial executives in New York; and, as a result, the American Engineering Standards Committee is now working out a comprehensive plan for the correction of this trouble that promises real relief and which certainly merits the hearty support of every advocate of standardization.

Baccalaureus Artium Rubberensis

SHOULD a rubber worker be engaged solely on his own assurance, or on the recommendation of a former and perhaps too charitable employer? Should he be vouched for like a certified accountant, or required to bear a quasi-academic degree like B. A. R. (*baccalaureus artium rubberensis*)? Many old-fashioned rubber men who have learned their trade in the school of hard experience would, of course, look askance at sheepskins and bluntly tell applicants that, instead of knowing all about rubber, they had only begun to learn. But the rubber industry has grown up, and forward-looking executives are seeing the need of special or intensive training that would justify the granting of documents attesting the proficiency of applicants for nearly all major and minor positions in the industry.

Already some leading American tire companies have organized and trained small bodies of workers so thoroughly that when the graduates of the course are awarded their certificates they are eligible for responsible positions in almost any factory department. But far more comprehensive, and altogether commendable, is the plan of the Institution of the Rubber Industry of Great Britain to hold examinations and provide technical diplomas for all branches of the industry, a plan which should do much toward the substitution of exact method for hit-or-miss or rule-of-thumb, should lessen losses, and promote quality and quantity of work. So, too, should it provide a new and strong incentive for all loyal and ambitious rubber workers.

The I. R. I. hall-mark would be conferred on mechanical and electrical engineers, chemists, physicists, and practitioners; and the diploma members would be of two classes, associates and fellows. The associates may be either those members who have had special scientific training, particularly in rubber engineering, chemistry, or physics; those who, having obtained diplomas in such branches, shall have had three years' practical experience; or those whose knowledge of general rubber technology has been acquired during ten years' works experience. Fellowship would be restricted to such as hold very important positions, have published works of exceptional merit, or in other ways rendered valuable service to the industry. Therefore, the I. R. I. diploma would be evidence of notable achievement.

ONE OF THE BOOT AND SHOE PAPERS CLAIMS THAT THE rubber shoe manufacturers are missing an opportunity in not making prettier goloshes (as it rather ineptly calls them) for women. It has evidently overlooked some of the recent creations of the rubber shoe makers which not only have color, style and daintiness, but as much quality and service as any of the plain-Jane rubbers of yesteryear. In fact, by making women's rubbers harmonize strikingly with fashionable attire, enterprising manufacturers have actually scored a victory of no small size; they have overcome at last the reluctance of modish women to make rubbers part of their standard equipment in footwear.

"AND IF THOU DRAW OUT THY SOUL TO THE hungry, and satisfy the afflicted soul; then shall thy light rise in obscurity, and thy darkness be as the noon day." Isa. 58:10.

Weftless Cord Tire Construction[1]

New Weftless Textile Product and Insulating Processes—Developed and Protected for the Rubber Industry

WEFTLESS or web cord tire construction, with all its attendant betterments and economies, now recognized by leaders in the industry, has become available to tire manufacturers through the use of "Ultratex" fabric and simple associated processes for its treatment. Although a patented fabric, its advantages in use are: there are no royalties to pay; there is no cotton surcharge, and no machinery investment. The fabric may be impregnated or direct calendered with no change in present equipment. More fabric yardage per pound of cotton, a more homogeneous, resilient and wear-resisting carcass at less cost are the principal results obtained.

A Little Theory and History

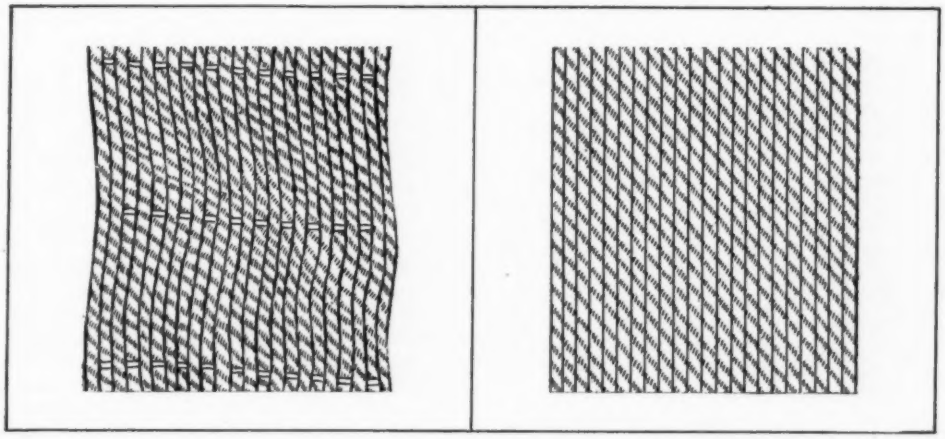
Fabric is the foundation upon which the pneumatic tire is built; it is the strength of the tire. For several years pneumatic tires were built with square-woven duck in which both warp and weft consisted of the same size and number of threads. The service mileage of such tires was short because of the great amount of internal friction due to the rubbing of the cross threads upon each other as the tire was intermittently flexed or distorted in use. It became obvious that the fabric causing the least amount of internal friction would last longest. In order to increase tire life the aim in recent years has been to decrease internal friction so far as possible by reducing the number and size of the weft threads to the minimum, the resulting product being the cord fabric of today. While the regular cord tire constructed with it represents a decided improvement over the square-woven or fabric tire, it still leaves much to be desired, for there remains, due to the friction effect of the weft threads, a decided constriction of the full measure of mileage elongation.

Cord Fabric Disadvantages

In the cord fabric tire the cords in each ply run parallel, with the exception of a few cross threads known as pick or tie threads, used simply to hold the cords in place while being impregnated. Since fabric cannot be thoroughly impregnated with rubber solution, the places where cords and threads cross will be left bare and at these points the sawing motion caused by the flexing of the tire generates frictional heat. Heat destroys rubber, causes separation of the plies, weakening the tires, making them easy to puncture, susceptible to stone bruises and finally to blowouts. Ninety-five blowouts in every hundred are due to friction.

It is not uncommon for a tire to reach a temperature of 265 degrees F. when driven at high speed over the road, and it has been demonstrated very clearly by experiment that when the temperature resulting from mechanical action reaches 230 degrees F. vulcanized rubber ceases to function as an adhesive compound and loses its function in the tire.

Theoretically, of course, each little cross or weft thread in standard cord fabric is promptly broken by the flexing of the tire in service and ceases to be a factor in the life of the carcass. But dissection of many cord tires proves that they often fail to break and continue to distort and chafe the cord fabric and to prevent even tension, or that, having broken, the broken ends become little thorns in the sides of the cords to "fester and cause inflammation."



Standard Cord Fabric

Weftless Cord Fabric

Standard cord fabric in being frictioned is very often distorted, and when cut on the bias and built into the tire produces what has become commonly known as a "buckle." After frictioning and skim coating, cord fabric is held in a relatively unyielding condition, due to the tying effect of the cross or weft threads; the surface of the fabric is wavy or uneven, due to the under and over weavings of the weft threads, all of which render good tire building unnecessarily difficult.

The Ultimate in Tire Fabric

It is apparent, therefore, that a large amount of useless cotton fiber is built into a tire by the use of weft threads in standard cord fabric. In a 34 by 4½ cord tire of standard construction, for example, there are over 1,700 linear feet of pick threads. For several years it has been realized that the ultimate textile development in cord tire construction would be a weftless cord fabric, as

[1]Written from information furnished by Ultratex Products Co., 303 Colonial Building, Boston, Massachusetts.

entire elimination of the weft threads would enable complete proofing insulation of each cord against friction and insure a smooth, even, rubber-coated surface without "buckling" distortion, each cord being drawn through all processes of manufacture at an even tension so that in building into the tire the resulting fabric would "stitch" down smoothly. In such a weftless cord casing would be found the maximum of elasticity, resiliency, and the practical elimination of the blowout, the consequent absorption of vibration prolonging the life of the car and insuring the greatest riding comfort.

Rightly a Product of the Textile Mill

The obstacle standing in the way of this much needed development has been the difficulty of producing such a weftless cord fabric economically on a commercial basis without expensive and complicated special machinery, and the belief that a cord web could not be handled or rubberized without the undesirable supporting weft. The chief trouble has been that past efforts to manufacture a weftless cord fabric have made it a process of tire production, whereas it is in reality a textile proposition best handled in a textile mill apart from the tire factory.

Early Experiments

Weftless fabric was originally made experimentally with a single cord of great length wound by hand from one bobbin, but the first attempt to produce it commercially was in the tire factory and by a method and machine briefly described as follows: A great number of spools or bobbins of cord were secured and erected upon a creel. Each cord was threaded through the usual method down to a reed which was suspended just above the bath in an impregnating machine. The various cords were drawn through the bath and out over a drier to which was attached a canting attachment which held the cords in alinement and served to bring them together so that the web of rubber which surrounded each cord caused it to adhere to the next one in sheet formation.

While this method produced a weftless cord cloth, the following disadvantages were apparent:

(1) Shipping expense, both ways of the bobbins; (2) Time required in the plant to prepare and handle; (3) Weavers' knots would hang between the lines and break the cord, causing great trouble and loss of time; (4) Uneven tensions were impossible to overcome in handling so great a number of cords as 640, the number then in use, and formed perhaps the most serious disadvantage, as to produce a cord fabric of commercial width for tire manufacture a much greater number would be required.

The Armorcord Fabric

Taking these problems to a textile mill it was learned that if there were produced on a warper a beam of a predetermined number of ends or cords through a reed or comb having the number of dents per inch desired it would be possible to get cords which, having gone through a comb once, would be sure to go through again without trouble from the knots. In this manner miles of cord fabric were made, but never wider than 28 inches, which was a serious objection.

The following are some of the major objections to the use of cords on a large beam in this manner:

(1) Weight and cost of beam; (2) The actual cost of handling and shipment overcame the differential cost of cotton of 5 cents per pound; (3) Hard and soft spots, or tight and loose cords caused great trouble in taking care of the slack or uneven tensions, although an adjustable tension bar was used to regulate the tension on the beam as a whole and suspended springs caught up the loose ends as far as possible; (4) Time and expense in handling the great number of cords as well as the commercial lengths, in that if for any reason it were impossible to run the entire yardage (over 600 yards) it was necessary to cut all the cords and to tie them through the comb, not only losing yardage but a considerable length of time; (5) The accidents and constant dangers attending the use of benzol to produce a cement caused most tire manufacturers to discontinue the practice of impregnating, and direct calendering became the popular method.

The Cord Fabric of Today

In order to overcome the objections cited, as well as to suit the production of a weftless fabric to direct calendering, it was decided in the light of past experience that in the textile mill itself was the place to obviate, to a large degree, the serious difficulties due to uneven tension. As a result it was found practical to weave a tabby end or flexible header of 12 to 18 inches and as wide as desired at each end of the required amount of cord warp yardage (usually 160 yards), enabling the use of a lesser number of ends per inch (usually 18); this practice seems to be desirable in the present condition of tire production, for it is a matter of economy without sacrifice to good cord construction. The resulting weftless cord fabric is wound on a shell of light construction, thereby reducing the shipping expense to one no greater than that of the present method of handling standard cord fabric.

Experience having proved the admirable characteristics of the product, it became the subject of an application for articles patent.[2]

Rubberizing Process

A method of rubberizing the fabric is afforded under United States patent,[3] which provides an easy means of securing the cords and of handling them so that a number sufficient to produce a commercial fabric width is possible. Users of the fabric will be licensed to fabricate and use the simple attachments necessary under this patent for the standard impregnating machine or calender in order to make the rubberizing possible. No charge is made for the attachments, nor is a royalty or commission asked for their use. The only requirement is that all orders be placed through exclusive sales agents, as the legitimate profit of the patent owners is derived from the reduced loomage cost of this type of fabric, which is sold to the trade at the market price of standard cord fabric.

As a Latex Fabric

"Ultratex" may be successfully rubberized and skim coated on the calender if desired, a soft friction compound being employed at even skim coat speed, or it may be impregnated with rubber latex cement. This does not mean latex held as such by an anti-coagulating medium. Uncoagulated latex, in which particles of rubber are held in suspension, will undoubtedly penetrate the fibers of the cotton to a very much greater degree than broken down rubber in cement can possibly do and produce a more thoroughly rubberized cord, for microscopic examination of latex-treated cords shows penetration to the "lumen" or hole in each small fiber of cotton.

Here, however, arises a question of degree. The term "impregnation," as commonly used in rubber shop practice, really means nothing more than "insulation." If "insulation" is accepted as meeting the present requirements of tire manufacture, a cement of rubber from latex may be used for impregnating. To latex may be added a predetermined weight of acetic acid to hasten coagulation to the point where latex ceases to be latex and the rubber globules form. The desired consistency of the batch may be readily maintained to insure insulation of each cord as it passes through the adhesive material in spaced relationship, each cord separated substantially from its neighbors, whereby the adhesive material will form a web therebetween.

No Patent Infringement Involved

It is claimed by the owners of the patent[4] that there is nothing to prevent licensees from using the natural rubber solution formed

[2] Joseph A. McLane, United States patent, serial No. 612,378.
[3] Joseph A. McLane, United States patent No. 1,420,271.
[4] Ibid.

in latex during the stage in which coagulation has taken place sufficiently to form a thin rubber cement that would leave cords coated therewith as they emerge from a bath of such solution, instead of forming a cement solution by breaking down crude rubber in benzol or other rubber solvent.

It may well be emphasized in this connection that rubber latex is understood to mean the milk or emulsion as received directly from the tree and carrying in suspension therein rubber globules. This latex quickly sours by fermentation and coagulates when exposed to atmospheric or other conditions. The result of this coagulation is the production of what is known as raw rubber, there having been both a chemical and physical action which changes the latex into rubber. After latex has congealed to a certain point of consistency, as already stated, it ceases to be latex.

"Ultratex" Advantages

By adopting this fabric the tire manufacturer is relieved of the added responsibility, annoyances and capital investment incident to textile manufacture, and a high-grade, uniform product, the newest and approved cord tire fabric is supplied as required by reputable mills. The rubberizing processes and attachments licensed for the use insure complete cord insulation against friction and moisture without the weakening effect of breaking down crude rubber for impregnating solution nor the dangerous and expensive use of rubber solvents. There is no possibility of injury to the fabric by forcing the rubber under great pressure into the fabric, as in frictioning.

The fabric saves about four ounces of yarn per square yard of fabric, owing to the elimination of the yarn that supplies the weft in standard cord fabric. This means more yardage per pound. Moreover, the time saved in the use of a product of such uniformity effects a considerable reduction in the labor cost of tire building. It is claimed that the combined savings due to its use will average well over two dollars per tire in the usual factory production of assorted sizes, which is perhaps rather more than average profits under present trade conditions.

Apart from the tire construction improvements due to the use of such a weftless cord fabric as that under consideration, numerous other advantages may be summarized as follows: The rubber web which insulates the cords against friction, joining them in parallel spaced relation and reducing tire heating to the minimum, clings tenaciously to the cords, yet stretches, forming a homogeneous but elastic fabric structure, resilient and resistant alike to puncture and wear. Owing to the absence of tie threads the position of the cords is uniformly regular, giving a smooth surface which stitches down quickly and perfectly, thus improving the tire and reducing its building cost. All the cords in each bias ply as built into the tire carcass are alike as to length, angle and tension, and each cord carries its proportionate share of the load on the finished tire. No cord nor group of cords carries any undue strain. There is a complete absence of resistance to uniform flexion throughout the carcass. Thus, the production of a successful, economical, rubber-webbed cord tire is brought within the reach of any manufacturer desiring to adopt this newest development in tire construction.

CONTINENTAL TIRE LEADS IN URUGUAY

The Continental tire is in the ascendancy in Uruguay and creates the most serious difficulties for American makes. The German representatives have made decided cuts through discounts, allowing (July 2, 1923) 30 per cent plus 15 per cent. Michelin is allowing 25 per cent plus 5 per cent plus 12 per cent; Dunlop, 40 per cent. The average American discounts are 35 per cent plus 5 per cent.

DURING THE CALENDAR YEAR 1922 MEXICO'S IMPORTATIONS OF our rubber hose were valued at $234,443. Other leading purchasers were England, $223,003; British South Africa, $168,041; Quebec and Ontario, $111,071; Chile, $81,606; and Cuba, $79,461.

George Stafford Whitby, Ph.D.

Of the eminent scientists and chemists who have specialized in the study of caoutchouc, Doctor G. S. Whitby was one of the first to engage in the study of plantation rubber on the spot. He is a native of Hull, England, born in 1887; graduated associate of the Royal College of Science, London, 1906; first class honors B. Sc. in chemistry, University of London, 1907; M. Sc., McGill University, Montreal, with the Governor General's medal for research work; Ph. D., McGill University.

Dr. G. S. Whitby

For four years after graduation he was demonstrator at the Imperial College of Science and Technology, London. Since 1917 he has been associate professor of chemistry at McGill University, Montreal, Canada.

In 1910 Dr. Whitby went to the Far East as chemist to the Société Financière des Caoutchoucs, a large group of plantation companies operating in Malaya, Sumatra, and Java. He remained there for seven years except for one year spent on leave in Europe, which he largely utilized for experimental work on rubber. While in the Far East he introduced a number of procedures for handling latex and the preparation of raw rubber, including a system of receiving, bulking, and coagulating tanks placed at different levels, which has been widely adopted on plantations.

Since his return from the Far East Dr. Whitby published, in 1920, "Plantation Rubber and the Testing of Rubber," which has undoubtedly had considerable influence on the recent trend of rubber research, and is a classic in this field. His research work has been largely occupied with rubber problems, such as the full chemical examination of the non-caoutchouc constituents of rubber and latex, an examination that has already yielded highly important results in connection with the rubber resin, the chemical character of which has during the past two years been elucidated for the first time by Dr. Whitby, in conjunction with one of his students, J. Dolid.

Dr. Whitby has done successful research work in other fields, namely, the fats; but his main work has been on rubber. He is unquestionably building up at McGill University a school of rubber research of world-wide reputation.

Dr. Whitby is a member of the Executive Committee of the Rubber Division of the American Chemical Society; member of the Commission Internationale de la Nomenclature de Chemie Organique, and of Sigma Xi.

SEPTEMBER MEETING OF N. A. W. M. D., INC.

Arrangements have been made to hold the next meeting of the National Association of Waste Material Dealers, Inc., Times Building, Times Square, New York, N. Y., in Chicago, Illinois, the date being September 25 and 26. Eastern members planning to attend should send in their names to the secretary of the organization early, as special reservations are being made.

NEW SCRAP RUBBER RATES IN WESTERN TERRITORY

The Western Trunk Line Committee has approved the proposal to have scrap rubber, including scrap rubber tires, added to the commodity item for rags in western trunk line territory. Shipments must be in straight carloads and the minimum weight will be 30,000 pounds for cars forty feet or less in length, and 40,000 pounds for cars over forty feet to and including fifty feet in length. The proposal will materially reduce the rates on scrap rubber.

Estimating Costs of Mechanical Rubber Goods—III[1]

Belting—Packing—Sundry Molded Goods

By Joseph J. Dawson

We have previously considered in detail the procedure necessary for making estimates for the major departments; namely, compounding, milling and calendering, also the estimating of costs for various kinds of hose.

It is the purpose of this article to give a general idea as to how belting costs are estimated, and the estimating procedure, which is considered the best practice for packing and sundry molded goods. The method of arriving at coefficients has been thoroughly explained in the previous article[1] on hose, and as this procedure is exactly the same in the case of belting, we may refer to the explanation previously given for computing belting coefficients. The same general plan as previously used—that of taking the most complicated specification in a particular class and explaining it in detail—will be adhered to.

Friction Surface Belting

Friction 32 oz. ..... Ply as ordered
Seam Strip ..... ¾ x .055

We will consider 10-inch, 8-ply belting as an example to show how the duck cut is figured.

Centers, 2 x 9½	19"
First wrapper	20"
Second wrapper	20⅛"
Outside wrapper	20¼"

These figures are computed from the following table, which has been proved to be correct for all belting cuts.

32 OUNCES

Ply	Centers	1st Wrapper	2d Wrapper	3d Wrapper	4th Wrapper
3 & 4	Even	Add ⅛	.....	.....	.....
5 & 6	Deduct 2/8	Add 2/8	Add ⅜	.....	.....
7 & 8	Deduct ½	.....	Add ⅜	Add ⅞	.....
9 & 10	Deduct ⅝	Deduct ⅛	Add 2/8	Add ⅜	Add 1⅛

28 OUNCES—26 OUNCES—24 OUNCES

Ply	Centers	1st Wrapper	2d Wrapper	3d Wrapper	4th Wrapper
3 & 4	Deduct ⅛	Add ⅛	.....	.....	.....
5 & 6	Deduct 2/8	Add ⅛	Add ½	.....	.....
7 & 8	Deduct ⅜	.....	Add ⅜	Add ¾	.....
9 & 10	.....	.....	.....	.....	.....

A total of the various cuts as figured above is 80⅛ inches. This cut multiplied by the coefficient gives the total weight of 32 ounces friction duck in 100 feet of 10-inch, 8-ply belting. This weight computed at the cost price as shown in our first article gives the material cost plus labor and overhead for the major departments.

The water weight of the ¾-inch by .055-inch strip is figured as explained for hose covers, and multiplied by the specific gravity of the stock to obtain the total weight for the rubber strip. This weight multiplied by the pound price as previously explained gives the material cost of the strip for 100 feet of belting.

To these material costs is added the labor and factory overhead for making, curing, measuring and rolling, and the total factory cost of the belt obtained. The administrative overheads are added in the same manner as previously explained, to arrive at the total estimated cost of 100 feet of 10-inch, 8-ply friction surface belting.

Rubber Covered and Conveyor Belting

Friction 32 oz. ..... Ply as ordered
Cover o. s. ..... .055
Cover o. s. ..... Thickness as ordered

The only new condition which arises in figuring rubber covered and conveyor belting is the cover. In the case of rubber covered belting where the cover is the same thickness on both sides the cover cut is figured as if it were an additional wrapper, and the weights are estimated as explained for covers for rubber hose. In the case of conveyor belting the cut of the cover on the pulley side is figured as being the exact width of the belt, and as the cover on the conveyor side is carried down over the edges, the additional length to bring the cover down over the edges is allowed in figuring cuts. The usual procedure is used in obtaining weights.

Slab Packing

Slab packing is in a sense practically the same as belting, from a standpoint of estimating costs, inasmuch as it is made up of several plies of friction duck with or without a rubber cover, as ordered. It is less complicated, because of the fact that the plies are only carried to the edge of the slab and are all of the same width and length. In the case of packing laid on the bias it is necessary to consider the additional labor and overhead costs for cutting on the bias and making splices.

After the slab cost has been estimated, the cost of curing, rolling, spiralling and graphiting—if so ordered—and boxing must be added.

Sundry Molded Goods

Practically all sundry molded articles resolve themselves into some sort of geometrical figures and the formulas for these particular figures are applicable. Where metal inserts are used, the actual weights may be secured and the rubber weight of their volume computed so that they may be deducted from the total weight of the article.

The writer believes that inasmuch as sundry molded goods continually demand new and varied types of product, that the best method of estimating labor and overhead costs is by establishing a unit basic labor price and figuring the overhead for the department wherein the article is produced on a percentage basis to the direct labor. These basic figures can be easily obtained from past performances on the particular articles desired, but if the article is new and there has been no similar article from which a reliable estimate as to a basic cost may be figured, the estimating department should confer with the production department and mutually establish a temporary estimate based on their knowledge and experience.

It will be remembered that the writer advocated in his first article that the supervisor of costs, especially in the rubber business, should be as practical as either the factory manager or the superintendent.

After going over carefully this series of articles which have been written on mechanical rubber cost estimating, it will be readily seen that there are so many conditions arising in the rubber business that it is absolutely essential that the cost man be practical, inasmuch as he is continually called upon not only to give estimates on future work but to advise as to economical production information based on his judgment.

VALUES OF OUR MAY EXPORTS OF MECHANICAL RUBBER GOODS, estimated at $418,642, have outdistanced the previous high figure this year for March, which totaled $409,604.

ENGLAND CONTINUES TO FAR OUTSTRIP OTHER NATIONS IN HER purchases of our rubber thread, the figure for the month of May being estimated at $65,889. Her importations of such goods during the present year have been on a steadily increasing scale.

[1] Continued from THE INDIA RUBBER WORLD, August 1, 1923, 698-699.

Addition of Compounding Ingredients to Rubber Latex[1]

Inorganic Fillers—Organic Fillers—Vulcanization

In the compounding of latex it is well to forget most of what is known of rubber compounding either with breaking down machinery or rubber benzol. Both latex and rubber cement are rubber solutions but their colloidal condition or state of aggregation is entirely different. In organic solvents, rubber behaves as a lyophilic colloid and swells up to form a gel with every appearance of a continuous structure. Under the microscope no individual particles can be seen. The type of solution is analogous to that of gelatin in water. Latex, on the other hand, is a lyophobic colloid consisting of particles of rubber dispersed in water and moving at random without any sort of orientation or structure.

Attention would not be called to this obvious difference if we had not found that many rubber chemists have overlooked it, and if it was not of such fundamental importance in compounding. With breaking down machinery or rubber cements almost any filler can be added and the rubber will still be the external phase. The aim has been to get the finest possible fillers.

With latex, however, the condition often becomes reversed and the rubber particles tend to assume the internal phase. This is particularly liable to happen when the particle of the compounding material is small in comparison with the size of the latex particle.

Inorganic Fillers

The addition of fillers of the inorganic type presents a variety of problems. Finely divided materials such as are suitable for this use carry an electrical charge and, in case it is opposite to that of the latex particles, may cause coagulation of the entire mass. Other fillers that carry the proper charge may have sufficient soluble material present to cause coagulation by the presence of a coagulating ion. Many materials such as clay, whiting, talc and silica can be added to latex in all proportions, if the precaution is first taken of wetting the dried material before adding it to the mix. The amount of water required will vary with the filler used, being probably dependent upon the water absorption value of the material, but in any event the final mix will average about fifty per cent total solids in extreme concentrations.

Zinc oxide can be mixed with latex in low percentages but a slow agglomeration takes place, while higher percentages cause coagulation. Carbon-black even in relatively small amounts causes coagulation. In this connection it is interesting to note the effect of different grades of the same filler on the rapidity of coagulation and the amounts which can be added without causing coagulation of the mass. Thus, a high grade superfine gas-black will cause coagulation in percentages of one to two per cent while the amount of coarser lampblack which can be added will run considerably higher. The answer is probably the magnitude of the electrical charge carried by the particles.

Causes of Coagulation by Fillers

In general, there appear to be three fundamental causes for the coagulation of latex by the addition of fillers.

The first is insufficient wetting of the particles. With materials which readily absorb water there appears to be an actual absorption of the water, leaving behind the rubber particles in such concentrations that they coagulate. The remedy for this is obvious,—to saturate the material with water before adding the latex. The quantity of water required varies greatly with the material. With substances such as ground silica a mere trace of moisture is sufficient, while with more absorbent materials, such as china clay, enough water must be added to make a rather thick paste out of the material, which can then be added to the latex.

The second cause of coagulation is the presence of a positive electrical charge on the particles of the filler of sufficient magnitude to discharge the negative charge on the rubber particles and bring about coagulation. There are two methods to combat this: First, the addition of some negatively charged material to the filler to neutralize the positive charge before the latex is added; second, the addition to the latex of further protective colloids other than those naturally present. This is far too detailed a subject to be gone into here, as the best type of protective colloid varies with the different fillers and the use to which the compounded material is to be put. Scores of these materials have been investigated and many unexpected and interesting effects observed. Some of the broad groups which appear effective are the various classes of proteins and their hydrolysis products obtained by the action of enzymes, acids, and alkalies; complex carbohydrates such as starches, dextrines, etc.; glucosides such as digitalin, saponin, etc.; a great variety of complex organic sulphonic and carboxylic acids and their salts and in some cases colloidal inorganic material.

The third general cause of coagulation on the addition of a filler is a slight solubility of one or more of its ingredients which gives rise to a sufficient concentration of a coagulating ion to cause trouble. Here again two remedies may be applied: First, the addition of some non-coagulating material which will set free an ion that will form an insoluble compound with the troublesome ion or repress its solubility; second, the addition of further protective colloids to the latex, as explained previously.

After a filler has been dispersed in latex by stirring, it will soon settle out again unless it is colloidal in nature. However, if the latex is subjected to the method of partial coagulation as described in our last article,[2] the great increase in viscosity will hold the filler evenly dispersed indefinitely.

To compensate for some of these difficulties which have been encountered in the addition of ordinary fillers to latex, there are many other substances which can be readily added to latex, materials which can be mixed to crude rubber or rubber cement only with the greatest difficulty. In general, these are the water soluble colloids, preferably of the irreversible type. One broad class of these are the colloidally precipitated metal salts, oxides and hydroxides, such as can be obtained with barium sulphate, aluminum hydroxide, silicic acid, etc. Owing to the extremely small particle size of these substances they usually tend to form the external phase and strongly modify the properties of the rubber. For example, a mixture of equal parts rubber (in the latex form) and colloidal silicic acid, on coagulating, pressing under a hydraulic press, and drying gave a dense white non-elastic mass somewhat resembling ivory. Naturally colloidal materials, such as Bentonite, which swell in water to form a jelly, can be similarly used but the majority of these are reversible on drying.

Organic Fillers

Passing from the field of inorganic fillers to the organic ones, a different type of problem is encountered. Such materials as glue are colloids and the admixture with latex presents no particular difficulties, it being merely necessary to dissolve them in water, and insure neutrality or slightly alkaline conditions before adding them to the latex. Casein, an analogous protein, can be handled in the same way. As was previously mentioned these materials are in the class of protective colloids, being of a lyophilic

[1] Courtesy of F. R. Henderson & Co., Inc., New York, N. Y.

[2] THE INDIA RUBBER WORLD, August 1, 1923, pp. 703-706.

nature themselves, and if added in large proportions tend to become the external phase and strongly modify the properties of the rubber. Thus, three parts rubber and one part glue is very short, but still tough and somewhat elastic, while a mixture of equal parts of glue and rubber resembles glue more than rubber as the elasticity has disappeared and when thoroughly dried the material will break on bending.

Oils such as cottonseed, linseed, tung, and other vegetable oils can in many cases be added directly to the latex if they are violently stirred. The alkaline nature of the latex seems sufficient in some cases to act as a protective colloid for the emulsification of the oils and a fair colloidal suspension of the oil in the latex can be obtained. It is safer, however, to make an emulsion of the oil first, using a protective colloid for this purpose and then adding the emulsion to the latex. The behavior of such mixed emulsion when coagulated and dried, clearly shows the nature of such compounding. When first precipitated the state of aggregation between the oil and the rubber is quite different from that obtained in mixing rolls. The particles of oil are evenly but heterogeneously distributed throughout the mix but have not dissolved colloidally in the rubber to a homogeneous mass. For example, a mixture of equal parts of cottonseed oil and rubber can be obtained in this way which will have no tack for some time. On drying and standing for several days the mixture will slowly change to a gelatinous sticky mass similar to that which would be obtained on mixing rolls with crude rubber.

The vulcanized oils, or factice, are a different type of filler. Being insoluble in most common solvents, they do not lend themselves readily to emulsification and their addition is difficult. Some of the less highly vulcanized materials of a resinous type can be dissolved in suitable solvents and then emulsified. It should be noted, however, that the manufacture of stable emulsions of this type of material is rather difficult, and that mere suspensions of the material in water will not suffice. A microscopic examination of the emulsion should show a dispersion approximating that of the latex to secure the best results.

A slightly different type of filler is the saponified oil or soap. Such materials being strongly alkaline can be added directly to the latex, and insolubilized by the precipitation of metallic soaps directly in the latex.

Mineral rubber, gilsonite, mineral oils and other such materials may be emulsified under suitable conditions. Such materials, if too solid or viscous to be emulsified directly, may be softened by suitable organic solvents and then emulsified. Solvents such as benzol, aniline and carbon bisulphide which would ordinarily coagulate latex if added directly, may be emulsified first and then added with safety. In cases where it is undesirable to have the solvent present in the latex it is possible, if a proper emulsion has been made, to distil out the volatile solvent before adding to the latex, leaving behind the non-volatile material in an extremely finely divided state.

Special Fillers

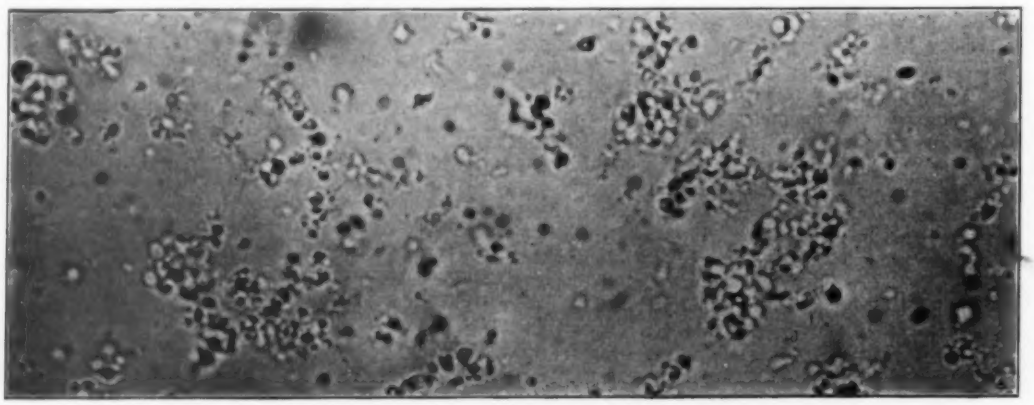
Other materials suggest themselves by analogy and their use either as a filler for rubber or the latex rubber, and may so modify their own properties as to render them valuable in the arts. Thus, starch can be readily mixed with latex either directly or after boiling or after alkaline hydrolysis. A marked increase in water resistance can be noticed both in the case of starch sizing and in hydrolyzed starch glue.

Viscose is miscible with latex in all proportions although the best results are obtained by first removing as much of the ammonia as possible from the latex. Its use increases the water resistance of the film and renders it more elastic.

The possibility of the use of latex in connection with paper pulp has been shown by Kaye,[3] but the possibility of incorporating beaten pulp as a compound of a rubber mix has not been emphasized. Thus by stirring in larger percentages of latex the rubber becomes a component rather than a beater size. Where bulk is required and the extreme tensile strength of fiber can be dispensed with, wood flour may be used. Wool shoddy and other animal fibers readily mix with latex and have a high affinity for the rubber therein.

Vulcanization

In passing from latex to vulcanized rubber there are two possible courses: First, the rubber in the latex may be vulcanized without breaking the colloidal state and this may be then worked up very much as with unvulcanized latex. This process was recently discovered by Schidrowitz.[4] Second, sulphur, preferably colloidal, and a suitable catalyst can be mixed with the latex and brought down with the rubber, by whatever means employed, and vulcanization be made the final step in the process.[5]



MAGNIFICATION 1800 DIAMETERS
Vulcanized Latex

Pre-Vulcanization

In our experiments with the reaction we have found that a limited amount of vulcanization can be obtained very easily in this way. In fact, we found that slightly ammoniacal latex containing ordinary melted sulphur, and no catalyst aside from the proteins naturally present, vulcanized about as readily as latex containing sulphur dissolved as polysulphides, or colloidal sulphur, and a catalyst. This reaction should afford an ideal method of studying the mechanism of vulcanization to obtain definite proof as to whether sulphur actually combines with rubber or

[3] THE INDIA RUBBER WORLD, June 1, 1922, pp. 606-607.
[4] P. Schidrowitz, British patent No. 193,451.
[5] P. Schidrowitz, United States patent No. 1,443,149. In general this process consists in heating an alkaline latex in an autoclave with sulphur and a catalyst to a temperature of about 140 degrees C.

merely catalyzes a further polymerization. With this in view, we made the following experiment:

A sample of latex was placed in a soda water bottle and sulphur (3 per cent on a rubber basis) was added. The whole was tightly stoppered and heated, without shaking, to 140 degrees C. for half an hour. The latex was then poured away from the sulphur, which separated as a cake on the bottom of the flask, and filtered through filter paper to remove any suspended sulphur. It was then highly diluted with distilled water and very carefully acidified with C. P. acetic acid to give the slowest possible coagulation. The coagulum was washed with dilute ammonia, C. P. rolled into a thin sheet, pressed under a hydraulic press and thoroughly dried. On analysis the rubber was found to contain 0.48 per cent sulphur.

Of course one experiment cannot be conclusive, but this certainly indicates an actual combination of the sulphur with the rubber. It is extremely unlikely that the protein or resin present could combine with this quantity of sulphur. The only other possibility would appear to be that the latex has a peptonizing effect on sulphur and actually disperses it. Under the microscope, the particles of vulcanized latex are seen to be quite different from those of the original latex. The pear-shaped form is much less marked and the tails are gone, as may be noted in the accompanying illustration. The sample analyzed and examined under the microscope was rather undervulcanized, as it still showed some tack with benzol.

It was our experience that higher degrees of vulcanization are difficult to obtain with latex without excessive coagulation. Also, with higher degrees of vulcanization the rubber does not adhere together well on coagulation.

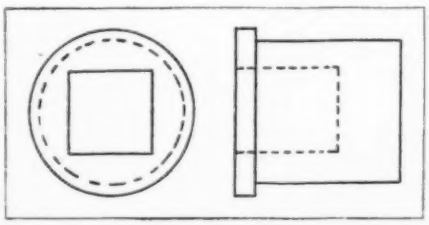
With a rather undervulcanized latex such as we were able readily to obtain, the course of coagulation is entirely parallel to that of latex itself. Probably owing to the hydrolysis of proteins, as thick a mass cannot be obtained on partial coagulation of vulcanized latex as with the unvulcanized, but the grouping of the particles and the general behavior are the same with both.

Post-Vulcanization

Following the usual procedure, either finely ground or colloidal sulphur may be mixed in the latex together with a dispersed catalyst. This mixture may then be used as the latex itself would be used, and following the removal of the water the product may be subjected to the ordinary treatment to bring about vulcanization.

Mandrels for Inner Tubes[1]

MANDRELS for making inner tubes are made from the best quality of seamless steel tubing, and especially for mandrel purposes in that it receives no annealing after the last pass through the draw bench, which allows the tube to retain the spring tension necessary in the wrapping operation of inner tube making.



Plug for 1¾-5-Inch Mandrels

Inner tube mandrels generally are made straight, sherardized, and polished. The ends are always plugged before finishing with cast plugs, machined to fit. The outer ends of the plugs have a cast square socket to provide a means of revolving them in the lathe for wrapping and unwrapping.

Circular mandrels are used chiefly for giant truck tire tubes and in some cases for the reinforced puncture-proof tubes. They have been suggested for "balloon" type tubes which will probably be manufactured on a smaller diameter mandrel.

Circular Mandrel

Circular mandrels are bent cold from the same stock and standard gages used for straight mandrels. They are supplied in three large sizes bent with an off-set. The reason for the off-set is to allow opportunity to strip the tube without chance of injury and to allow greater rapidity of this operation.

In the tables below are listed details of standard straight and circular mandrels used for fabric, cord regular and over-size tubes and truck tire tubes.

STANDARD STRAIGHT MANDRELS FOR FABRIC SIZE TUBES

Inner Tubes Inches	Mandrels Inches O. D.	Gage No.	Length Feet
3	1⅞	13	10
3½	2⅛	13	10
4	2⅜	13	10
4½	2¾	13	10
5	3⅛	11	10
5½	3⅜	11	10
6	3⅝	11	10

STANDARD STRAIGHT MANDRELS FOR CORDS OR OVERSIZE TUBES

3	1⅞ and 2	13	10
3½	2¼	13	10
4	2½	13	10
4½	2⅝ and 3	13	10
5	3¼	11	10
5½	3½	11	10
6	3¾	11	10

STANDARD STRAIGHT MANDRELS FOR TRUCK TUBES

6	3⅞ and 4	11	10
7	4¼—4½	11	10
8	5 —5¼	11	10
9	5½—5¾	11	10
10	6 —6½	11	10

There are also used ⅛" to ⅜" over and under for tubes of both cord and fabric tires.

STANDARD SIZES CIRCULAR MANDRELS

Inner Tubes Inches	Mandrel Inches O.D.	Gage No.
30 x 3	2¼	13
30 x 3½ 32 x 3½	2½	13
31 x 4 32 x 4 33 x 4 34 x 4	2¾	13
32 x 4½ 33 x 4½ 34 x 4½ 35 x 4½ 36 x 4½	3⅛	11
33 x 5 34 x 5 35 x 5 37 x 5	3⅝	11
36 x 6	4	11
38 x 7	4½	11
40 x 8	5¼	11
42 x 9	5⅞	11

[1]Data supplied by The New Haven Sherardizing Co., Hartford, Connecticut.

Interesting Letters From Our Readers

Necessity of American Controlled Plantations

TO THE EDITOR:

DEAR SIR: There is at present probably $250,000,000 worth of manufactured rubber goods, tires, and goods in process of manufacture, in the hands of rubber manufacturers in the United States. This inventory is inflated to the extent of the difference between a free market price of crude rubber of probably 12 cents and the present fictitious government controlled price of 28 cents or 29 cents. It is my opinion that 90 per cent of the agitation in favor of the British Government controlled price of crude rubber by American tire manufacturers is based upon the desire to keep inventories inflated to the extent mentioned rather than to go through the inconvenience and loss absorption which would be necessary were rubber to be again thrown on the market as a free commodity, its price to be governed by the law of "supply and demand" rather than the law of "supply and the British Government."

All of the arguments I have read in favor of the Stevenson act, such as the letter written by H. Eric Miller, addressed to H. S. Hotchkiss, president of the United States Plantations, Inc., and the General Rubber Co., which letter was reproduced in your August 1 issue, are based upon the antique idea that prices of crude rubber nowadays should be governed, not by competition but by a rule of thumb cost, which to my mind will tend toward the wildest extravagance in the production of rubber; eliminate any vestige of competitive betterment among plantation owners; destroy all initiative for the production of better rubber at lower costs; and absolutely induce utter laziness in the productive forces at work in the Far East, and a smug and sleek self-satisfaction in the administrative offices in London.

By this same outrageous rule of reasoning, I can prove to the British Government that a 35 by 5 cord tire should sell at $100 today, whereas the open market price is about $38, and by this same foolish line of reasoning any good statistician in the south could prove that the southern farmers should be entitled to 50 cents or 60 cents a pound for cotton, whereas the open market price today is around 22 cents.

For the first time in my life I advocate a government dictated price on cotton in the United States as retaliation for the government dictated price on crude rubber. If the American public is going to fatten the treasuries of British plantation owners, then I think the British public should enrich the southern growers of cotton. There would be just as much basis for the American Government to say the price of cotton should be 45 cents a pound, effective at once, as there is for the British Government to continue its unholy control of the price of crude rubber.

The continuance of the Stevenson act in force in the Far East marks a new period in the history of modern business because it seems to me it announces to an inflation-weary world that inflation shall continue under government supervision, and opens the way for governments in all parts of the world where monopolies are enjoyed, to keep up the cost of living to an unreasonable figure. The inauguration of American government control over the price of cotton, with a minimum figure of, say, 45 cents per pound, would certainly give the British Isles a taste of what we now have; and can any American rubber manufacturer conceive, under such conditions, of the Lancashire mill owners arising in glee and praising such restriction? What would happen would be something far different. There would be one long, continuous howl in the British press. They would start raising cotton in India as they never raised it before, and it is the writer's opinion that within two or three years the British colonies would be raising all the cotton that England needs, and that is precisely what we should do in the matter of crude rubber.

The very fact that England has allowed this Stevenson act to remain in force is ample evidence that we should drive ahead toward the cultivation of rubber plantations in American possessions, or American colonies, and that the least we could do would be to offer the utmost encouragement to South American rubber producers and undertake the development of plantations in the Amazon district as well as in the Philippines.

D. M. MASON,
General Manager, The Mason Tire & Rubber Co.

August 11, 1923.
Kent, Ohio.

REPORT OF TIRE AND RIM ASSOCIATION OF AMERICA, INC.

Statistics regarding the activities of The Tire and Rim Association of America, Inc., have been recently issued, and from the tabulation below it will be noted that millions of rims causing more or less trouble might have been put on the market in recent years had it not been for the efforts of this well-known organization.

REPORT OF RIMS APPROVED AND REJECTED BY TIRE AND RIM ASSOCIATION OF AMERICA, INC., FOR 1921-1922 AND FIRST HALF OF 1923

	1921	1922	1923
Total number rims inspected.....	10,860,046	17,789,381	13,360,164
Number of rims approved.....	9,175,039	16,281,583	12,161,543
Number of rims rejected.....	1,685,007	1,507,798	1,198,621

Rims approved and branded by the Association are classified in sizes as follows:

SIZE		1921 Number	1921 Pct.	1922 Number	1922 Pct.	1923—(6 mos.) Number	1923—(6 mos.) Pct.
26 x 2½		1,157	0.	none	....	none	....
26 x 3	Cl	12,629	0.1	16,730	0.1	22,508	0.2
28 x 3	Cl	26,902	0.3	61,142	0.3	41,238	0.3
30 x 3	Cl	532,034	5.8	782,816	4.9	467,354	3.8
27 x 3½	SS	.....	....	.....	....	7,977	0.1
30 x 3½	CL	5,588,656	60.9	8,334,385	51.2	5,827,061	48.0
30 x 3½	SS	172,238	1.8	1,632,809	10.0	1,736,325	14.3
32 x 3½		323,784	3.5	186,937	1.1	82,351	0.7
28 x 4	SS	.....	....	.....	....	951	0.0
28 x 4	Ap	.....	....	.....	....	703	0.0
31 x 4	Cl	.....	....	.....	....	634,261	5.2
31 x 4	SS	.....	....	4,319	0.0	90,314	0.7
32 x 4		1,261,475	13.7	3,041,559	18.7	1,883,533	15.5
33 x 4		487,206	5.3	411,621	2.5	119,736	1.0
34 x 4		32,041	0.3	59,696	0.4	12,375	0.1
29 x 4½		.....	....	5,410	0.0	32,029	0.3
32 x 4½		326,412	3.5	1,065,220	6.6	752,194	6.2
33 x 4½		.....	....	79,787	0.5	80,281	0.7
34 x 4½		346,254	3.7	458,478	2.8	266,951	2.2
36 x 4½		8,323	0.1	11,265	0.1	298	0.0
30 x 5		.....	....	508	0.0	2,299	0.0
34 x 5		48,637	0.5	112,234	0.6	79,794	0.6
32 x 6		.....	....	676	0.0	1,392	0.0
36 x 6		2,928	0.0	11,906	0.1	10,402	0.1
34 x 7		.....	....	282	0.0	188	0.0
38 x 7		1,151	0.0	8,102	0.1	3,526	0.0
36 x 8		.....	....	353	0.0	1,066	0.0
40 x 8		1,127	0.0	4,795	0.0	4,111	0.0
44 x 10		190	0.0	.....	....	.....	....
Millimeter		1,895	0.0	6,755	0.0	365	0.0
Totals	....	9,175,039	....	16,281,583	....	12,161,543	....

KEY:—"Cl" Clincher, "SS" Straightside, "Ap" Airplane.
NOTE:—Supervisory inspection on all straightside rims started June 1, 1922. Since that date all rejections are clincher rims.

MOTOR AND ACCESSORY MANUFACTURERS' CONVENTION

The fall convention of the Motor and Accessory Manufacturers' Association, to be held September 19-22 at the Copley-Plaza Hotel, Boston, Massachusetts, is generally regarded as a congress of the automotive industry.

Widening the Market for Automotive Products, the dominant theme of the meeting, will be expressed by informing speakers at the various sessions. O. W. Rutherford, president of the association, and vice president of The B. F. Goodrich Rubber Co., will preside at the opening meeting. F. E. Titus, vice president of the International B. F. Goodrich Rubber Co., will speak at the afternoon session September 20. There will be a boat trip, shore dinner and dance at Pemberton Inn, Nantasket Beach, on the evening of September 20, and a golf tournament will be held Saturday, September 22.

IMPORTS OF LONG STAPLE COTTON INTO THE UNITED STATES FROM Egypt during July, 1923, were 1,500,832 pounds, valued at $506,614.

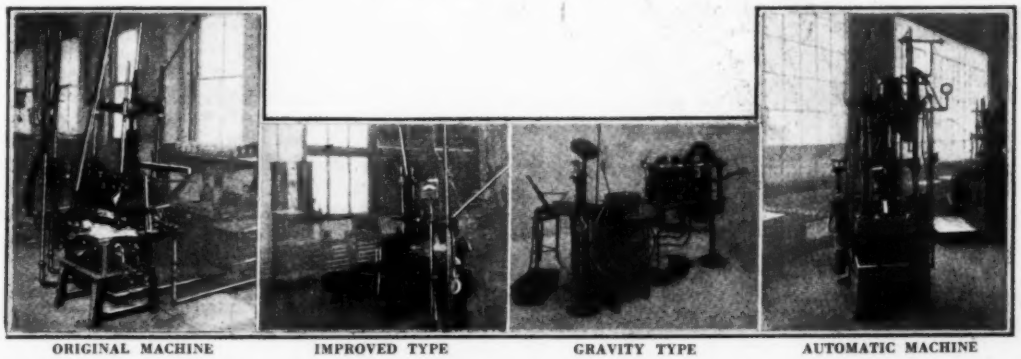
Die Casting Rubber Molds[1]

Method of Making Non-ferrous Finished Castings—The Process and Its Applications—Possibilities of Die Casting Molds, Forms and Lasts for Rubber Work

Die Casting

THE avalanche of motor propelled vehicles which marked the beginning of the present century, together with the evolution of many automatic vending, printing, and talking machines, created a demand for a simpler and cheaper method for producing accurate castings than the old-fashioned sand mold process, and led to perfecting the American method of die casting. This process consists in forcing fluid non-ferrous alloys, by heavy pressure, into heavy chilled steel molds or dies, thus producing smooth, solid castings with great rapidity and accuracy.

The process was originated about 1895 by H. H. Franklin, of Franklin automobile fame, who developed the casting of zinc, tin and lead base alloys. In 1907 H. H. Doehler perfected and patented his die casting process and machine and placed die castings made from alloys of zinc, tin, and lead on the market. These castings were smooth, accurate, and required little or no machining. From this beginning—the process developed rapidly. Metal mixtures or alloys were evolved with strict regard to metallurgical principles. New and improved casting machines were devised and scientific casting methods were adopted. The die casting industry has now become one of the largest and most important branches of the non-ferrous metal trade. One of the latest achievements is that of die casting aluminum alloys successfully and commercially. This accomplishment has developed into a business of immense proportions.



ORIGINAL MACHINE IMPROVED TYPE GRAVITY TYPE AUTOMATIC MACHINE

Evolution of the Die-Casting Machine

Applications of Die Castings

The main applications of die castings are in the automotive industries for starting, lighting, and ignition parts and accessories of all kinds, for parts of vacuum cleaners, household utilities, cutlery, sporting goods, electrical devices, radio apparatus, textile machinery, talking machines, musical and surgical instruments, office appliances, frames and parts for typewriters and adding machines, molds for golf balls and rubber dolls, balls, toys, etc. For parts not used electrically die castings are displacing hard rubber and molded phenolic resin products.

Die-Casting Alloys

Zinc, tin, lead, and aluminum are the bases for the white metals used in die casting. These are alloyed with nickel, copper, antimony, silicon, etc., to give mixtures adapted to special requirements.

Zinc base alloys range in melting point from 750 to 780 degrees F. and in tensile strength 16,000 to 35,000 pounds per square inch; aluminum base alloys, melting point 1,150 degrees F., tensile strength 21,000 to 28,000 pounds per square inch; copper base alloys, melting point 1,750 degrees F., tensile strength 60,000 pounds per square inch.

Tin alloys consist of tin alloyed with copper, lead, or antimony and include the so-called Babbitt metals. Hundreds of alloys can be compounded to suit various purposes.

Lead alloys consist chiefly of lead alloyed in various proportions with antimony, tin, or both. Many alloys can be compounded to meet particular needs in varying hardness, ductility and other physical characteristics.

Special Alloy for Rubber Molds

For rubber molds an alloy of aluminum and silicon is made. It is very light weight and contains no copper. It is grayish-white color, melts at 1,150 degrees F., and has a tensile strength of 28,000 pounds per square inch. It successfully withstands pressure and by grinding and buffing will take a high luster finish.

The machinery immediately concerned in the process of die casting comprises the mixing furnace for preparing the special alloys, the casting furnace, casting machine, and water cooled mold or die.

Mixing Furnace

For melting and mixing the various metals into alloys a gas or fuel fired pot furnace furnished with a hook is used. The dross from the operation is skimmed away and the clean metal cast into bars or ingots of convenient size ready for remelting in a similar furnace used as a source of molten metal for actual casting.

Casting Furnace

The casting furnace and casting machine are built in combination. The furnace part is an enclosed gas or oil fuel fired pot containing a stock of fluid casting metal which is kept replenished to a definite height by a supply hand fed with a ladle from an adjacent melting furnace.

In connection with the casting furnace there is an air pressure system at 400 pounds pressure per square inch used for ejecting the molten metal from the kettle through an iron gooseneck into the mold at the moment of casting.

[1] Data and illustrations used in this article furnished by the Doehler Die Casting Co., Brooklyn, N. Y.

Casting Machine

The casting machine comprises a heavy frame and track supporting a movable carriage for the mold or die, which is made to advance toward the casting furnace by hydraulic power when a casting is to be made. In this position the inlet of the die receives the outlet of the gooseneck of the furnace, thus establishing a tight pipe connection between the die and a point well below the surface of the molten metal supply.

Casting Die

The die is separable, built of steel, with highly finished cavities and cores when required. Its metal inlet makes a tight connection with the furnace gooseneck and the joint is maintained by hydraulic pressure during entrance of the fluid metal. The die also has a suitable outlet for air. Within the structure of each part of the die are copper tubes for circulating water for cooling the die and casting.

Casting Operation

The operation of making a die casting is accomplished with great speed. Large objects are cast singly. Small ones are gated together in the same die. The metal in the casting furnace is maintained from 1,200 to 1,500 degrees F. and is very fluid. The die closed and tightly clamped is advanced by the carriage, automatically making a tight connection as the outlet of the gooseneck enters the die inlet. Then the air system of the furnace is turned on and the fluid metal is shot into the die under 400 pounds pressure per square inch. The casting being made under pressure is highly compacted in the die and instantly cooled, without inclusion of air bubbles, by the water circulation of the die. The carriage is promptly drawn back from the furnace, the die opened automatically and the casting removed by the casting operator's assistant.

Die-Cast Rubber Molds and Parts for Cutlery and Sporting Goods

By this method casting can be made free from blow holes, with highly finished surfaces and extremely accurate measurements. The limits of weight for a single casting vary from 8 to 12 pounds; wall thicknesses 1/16 inch for small castings and ⅛ inch for large; variation from dimensions plus or minus .0025-inch.

Die Castings for Rubber Work

The die-casting process holds great possibilities as a practical economical method for making molds and forms for rubber manufacturing, especially where numerous duplicate molds are needed for volume production. Die castings are now being utilized as molds for balls, dolls, toys, etc. The molds are cast direct upon a master hob or model mounted in a heavy steel casting die. Similarly molds can be made for heels, bumpers and numerous small molded articles, however complex, required in large volume.

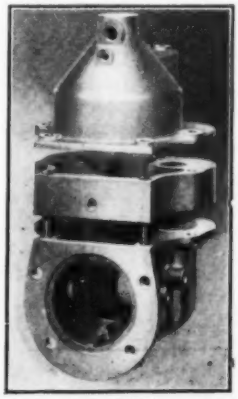
Anti-Skid Tread Designs

In tire molds die castings of the anti-skid designs for the treads have been utilized. The castings so produced are sufficiently accurate to rivet direct to the turned cavity of the steel tire mold, thus saving considerable expense otherwise required to engrave the anti-skid design in steel.

Golf Ball Molds

The construction of golf balls has been studied and developed with great exactness in every feature. This, of course, includes molds which are marvels in design, accuracy and finish, fashioned from special steel. The requirements of golf ball mold-making are now undergoing study as a problem in die casting with encouraging results.

The fact that thin walled hollow die castings are perfectly feasible leads to the suggestion that they may be made as forms for dipped goods such as nipples, balloons, gloves, etc., and for hollow trees and lasts for rubber boots and shoes.



Example of Hollow Die Casting

Shoe Lasts and Boot Trees

From the beginning of the rubber boot and shoe industry these goods have been constructed and cured on maple lasts and trees shaped on automatic turning lathes. Wooden lasts possess the advantage over metal ones of cheapness in first cost which is important where seasonal style changes in shapes require lasts of new model. This applies particularly to shoes and explains in large degree the persistent use of wooden lasts.

Boot shapes are essentially standardized by custom, therefore boot trees remain unchanged in form. This fact led to the experimental introduction of sand-cast aluminum boot trees something over 30 years ago, for, although moderate in first cost, maple lasts gradually become partially carbonized by the heat of repeated vulcanizations and consequently their sharp edges at the soles wear away by handling, destroying the value of the last by impairment of its shape. Where shoes can be standardized, metal lasts have been introduced to some extent and found feasible. So far, however, such lasts are of the sand-cast variety and lack finish and accuracy of shape.

The problem of die casting shoe lasts is one of die designing and presents no special difficulty in view of the complex hollow parts shown in the illustration, and similar complex forms being regularly produced for various purposes by this process.

HOSE VULCANIZED TO CONNECTION

A gasoline station operator, who had been bothered with brass connections working loose on high-pressure air hose, utilized a good tip given him by a rubber factory worker. Clamping the connection in a vise, he made the brass almost red hot with a gas jet, and when it had cooled somewhat forced the hose upon the connection. The result was that the hose was so well fused or vulcanized upon the nipple that the connection easily withstood a pressure of 180 pounds without a clamp, although the latter may be used in addition. Tire shops often use this mode of attachment to insure them against trouble in using high pressure air hose.

EXPORTS OF AMERICAN RUBBER THREAD INCREASE

Recent statistics compiled by *Commerce Reports* show that our exports for this year of rubber thread, as is also the case with certain other commodities, represent a steady increase in value. During the first and second half of the year 1922 the figures were $506,895 and $555,672 respectively, while for the first half of 1923 the value had risen to $561,670. Totals for the 1923 period are as follows: January, $52,277; February, $79,422; March, $81,837; April, $127,578; May, $121,382; and June, $99,174.

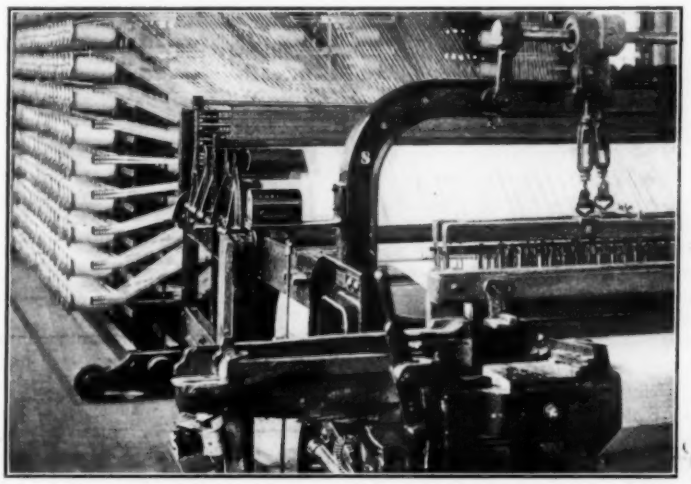
Automatic Counters in the Rubber Industry

Checking Preliminary Operations—Measuring and Counting Component Materials—Controlling Production and Cost Accounting—Tire Fabric Applications

By J. P. Blackiston[1]

MANY of the refinements of modern industrial practice, now common to rubber goods manufacture, have either been made possible or greatly simplified by a small instrument known as an automatic counter. It furnishes records of unfailing accuracy so necessary to increase production and control, to reduce manufacturing costs and maintain uniformity.

Automatic counters are made in several different shapes and sizes, and with numerous attachments for many purposes, the number of which is ever increasing in the rubber industry. They are made to count the revolutions of a shaft or the complete operations of a machine; to count the number of feet or pieces of material passing through a machine; to record the amount of flow of a liquid; to register the number of pounds; in fact, to give any totals desired. They furnish an instant record of every stage of an operation at any particular moment so that operatives on a piece work schedule can be paid up to the last stroke of the machine with accuracy and without dispute.



Pick Counter Mounted on Cord Fabric Loom

In use the counter is attached directly to the machine whose product it counts. No matter what the required unit may be—pounds, pieces, dozens, hundreds, thousands, inches, feet or yards—it can be connected to the machine and arranged to give an accurate, indisputable count of any product produced.

Checking Preliminary Operations

In many rubber plants automatic counters are employed to register the exact number of pounds or hundredweights of crude rubber unloaded from cars and placed in storage. At the outgoing storage door another counter registers the same units of weight of crude rubber sent into the drying or compound room. Hence an approximate inventory of raw material is always available. Losses in the weight of crude rubber due to atmospheric conditions in storage may also be checked.

By the use of these counters it is possible to record the number of pounds or hundredweights of rubber passing through the various processes of washing and drying; or in the compound room, the weight of each batch can be recorded as it is sent to the mills. The production of each mill can in turn be checked, and in the same way every foot or yard of fabric that is dried and inspected before calendering can be accurately measured.

Measuring Stock and Calendered Fabrics

In calendering fabric with rubber each of the initial materials can be measured as they are fed through the heated rolls and then the exact length of the finished rubberized material can be recorded as it travels on to the wind-up roll.

This forms a basis for determining which calenders are the most consistent producers, which are manned by the most efficient operators, and in many factories give the daily figures upon which premiums or piece work payments are made. The counters act as a court of last appeal since they cannot be tampered with to conceal errors or loss of time and production.

Counting Bias Fabric Strips

In the cutting department where frictioned fabric strips of proper sizes for making tires are cut from the large rolls of stock, automatic counters attached to the bias cutters count each strip as it is severed from the roll. The same application is used on slitting and re-winding machines which sever pieces of stock of both the proper width and length for making tires. Even where hand cutting is still employed the cutter records each piece cut at the end of the stroke.

Counters thus provide a means not only for determining the actual production of each cutting machine and operator for wage settlement purposes, but also enable the management to make a comparison between the actual number of pieces of rubber and fabric cut and the final number of tires produced in order to determine the loss from spoilage between processes and also to locate the cause or to fix the responsibility.

Controlling Tread Rubber Production

Going back to the compound room, more uniform batches of tread rubber are prepared owing to the check on all preliminary operations kept by automatic counters, and the quantity coming through the mills is recorded by them. While still hot from the mill this rubber is passed through a tubing machine, and as it issues from the dies in proper cross-section for the tire the actual finished length is measured by the counter attached to the machine.

These long lengths of tread stock are again cut into proper lengths for the tires being made and the number produced automatically counted. Even the books of treads are likewise counted as they are sent to the finishing department. This is important because in most factories the employes in this department are paid on a piece work basis. Where automatic counters are used there can be no mistakes nor disputes concerning counts.

Counting Bead Output

In a similar manner the number of wires cut for tire beads and also the actual number of finished beads produced can be readily counted at the instant they are made. This soon enables the foreman to recommend the most efficient employes for wage increases, and makes it possible for the timekeeper to determine accurately the time required for making a certain number of beads, which is often an important factor in working out production schedules.

[1] Advertising Manager, The Root Co., Bristol, Connecticut.

Controlling Tire Building

With automatic counters giving an accurate record of all stock entering the building room, and of every finished tire removed from the building machine, tire building is under rigid supervision and may be controlled as to quality and quantity production. It serves as a stimulant to keep the operator up to his standard of production, or, if he is limited to a certain number of tires per day, it shows that he has neither exceeded nor fallen below the specified number. Where piece work systems are in use it furnishes the only indisputable and the most economical basis of payment. If an operator quits his job his pay can be figured immediately and there can be no dispute about it.

Counting Cured, Inspected and Wrapped Tires

After vulcanization each tire is counted as it goes to the inspection room. In this department the casings are trimmed, buffed and painted, each one being counted as it comes from the machine or operator, a definite record of each employe's work thus being kept. Spoiled and defective tires are also recorded and a perpetual, unquestionable record of the department's work is continually at hand. Causes of trouble and the carelessness of employes can more readily be detected, due to the continuous vigilance which these faithful little watchdogs render.

Following inspection the first class tires go to the wrapping machines where each one is again counted before being sent to the stock room. Seconds are not wrapped but sold to tire dealers at reduced prices. These are also counted automatically as they leave the inspection department and again when delivered by the conveyor into the seconds store room.

Later when orders for shipment are made up the counters again play their indispensable part, giving an absolutely accurate count of each tire—never a miss nor a skip, never any uncertainty nor error in the count as is often the case when erring human minds and hands are employed.

Management Control and Cost Accounting

All these accurate and invaluable records compiled by infallible automatic counters are passed on to the cost department, the pay clerks, and form the basis for the actual production reports submitted to the superintendent, the general manager and on up to the board of directors. The evidence is all correctly registered and tabulated by the untiring little counters which never lie, play favorites nor absent themselves from the job.

Every tire represents a certain value or cash outlay by the factory. An absolute count of each tire as it leaves one department and enters another, or as it leaves the factory, is absolutely essential in order that correct cost values, labor charges and overhead expenses can be properly apportioned among the departments where they belong. Automatic counters are necessary to compile these figures of production that enable the cost items to be properly charged. Human count errs and forgets. Unreliability has no place in modern business. Every count must be indisputably accurate, and only by the use of automatic counters can this be assured.

Miscellaneous Manufacturing Applications

While automatic counters have perhaps been utilized more widely in tire manufacture than in any other branch of the rubber industry, they lend themselves with almost equal adaptability to innumerable applications in most other branches, especially mechanical rubber goods. They are invariably useful in checking most preliminary operations and offer a convenient means of measuring lengths of hose, belting and tubing machine products. They are of great service for counting rubber heels and soles, or molded rubber goods of any sort, which are first died out of sheet stock with punch presses. Such a count is accurate, with a great saving in handling, not approximate as by weighing.

Rubber footwear manufacture is also facilitated by numerous applications of automatic counters. Many large rubber mills have box making and printing departments in which an accurate count of operations and completed production means labor saving and greater efficiency. Possibilities suggest themselves without limit.

Applications in Tire Fabric Making

The textile industry, including tire fabric weaving, has benefited greatly from the use of automatic counters. On looms pick counters register the number of filling threads woven in. This makes it possible to pay weavers by the pick, now considered the most equitable and economical basis of payment, especially where a day and night shift are involved. Owing to simple, sturdy construction these counters render dependable service despite the excessive vibration of looms.

Nearly as important are hank counters to register the number of hanks produced on twisters, spinning, roving and drawing frames. Cards, drawing frames, finishing machines, knitting frames and numerous other textile machines have been successfully equipped with counters to record, control and increase production and provide an equitable basis of wage payment.

Progressive plant managers now regard automatic counters as indispensable equipment, a profitable investment rather than an expense, and those charged with the responsibility of keeping down production costs are not overlooking opportunities for an investment of this kind.

Tire Industry in Australia

The three chief local manufacturers of rubber goods, including tires, have made it impossible for American manufacturers of fabric tires to compete on a price basis in Australia. Drastic price cutting was inaugurated here by local tire manufacturers about the beginning of 1923.

Direct selling to the consumer is part of the sales policy of some of the more prominent Australian manufacturers, and Perdriau and Barnet Glass actively solicit business direct with the consumer and allow him the full trade discount. An attempt is being made by two well-established American companies to do away with this practice; the Australian Dunlop company and Michelin seem disposed to assist in this effort. While the general trade discounts are said to be 20 per cent and 5 per cent with an additional 5 or even 7½ per cent, it is known that some local concerns will give a secret additional rebate in order to meet competition.

At present Perdriau is offering cord tires in both metric and inch-clincher and inch-straightside sizes. The Australian Dunlop company has just put its first cord tire on the market at a price 33⅓ per cent less than imported cord tires. The trade in American cord tires is likely to be reduced by this new competition. Before this new cord tire was announced, local American firms expressed it as their opinion that if once the Australian manufacturers could establish their cord tires, American manufacturers would find it hard to retain their present business in cord tires. Local firms have the advantage of a high protective tariff on which they depend.

The home market is small, distribution facilities poor, and freight rates high. In addition, the labor factor is a very serious item and there is not much prospect of development of foreign markets.

In Australian imports of tires America occupies first place. During the first two months of 1923 foreign shipments of casings to Australia were valued at £162,717. Of this the U. S. supplied £87,251; Canada £47,008; France £18,463; England £7,764, and Italy £849. Imports of inner tubes were in all £18,789, the U. S. supplying £8,913; Canada, £5,314; France, £2,055; England £2,178, and Italy £290. As for solid tires, the United States' share of a total of £36,677 was £17,692; that of England £16,015; of Canada £727; of France £655; of Italy £727; and of Germany (for February only) £678.

Analysis of Tire Production, Inventory and Shipments

The Tire "Cushion" and Its Relation to Present Conditions

By W. Herman Greul[1]

THE tabulation giving statistics collected by the Rubber Association of America, of production, inventory and shipments of tires, affords a picture of the tire situation that is fairly representative although the figures cover only about seventy-five per cent of the totals of the industry.

The meaning of the figures, however, is clearer when so presented in graphic form as to bring out the relative size of production, shipments, and inventory over a number of successive periods of time. The accompanying charts have been constructed to visualize the relations of these three factors during 1922 and the first six months of the current year.

Referring to Fig. 1, which shows the situation for pneumatic casings, it will be noted that the first horizontal ruling above the zero base line represents the average monthly shipments during 1922. At no time did shipments-to-date equal or exceed production-to-date.

The upper solid curve represents "availables"—the number of casings available for shipment—and its height above the zero base line is proportional to the stocks on hand at the first of the month plus the production of the month. The shaded portion therefore indicates by its varying thickness the number of casings in stock in excess of shipping demands. It will be noted that when the dotted production line falls below the line for shipment this excess decreases (the shaded strip, or cushion, becomes narrower) and vice versa.

Starting with the picture at the end of January, 1922, it is seen that the production was above shipments, the difference going into stocks which then totaled 4,155,000 casings, slightly less

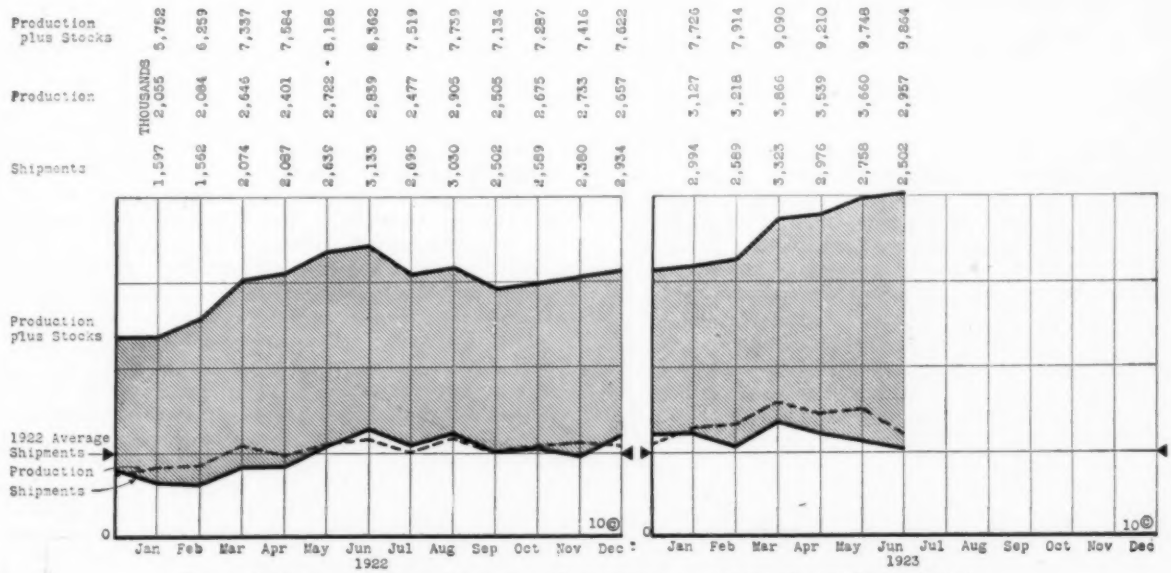


Fig. 1. Monthly production, shipments and inventory of casings. The cushion is shaded.

ings 1922 and the first six months of 1923; and the values of the points of all three curves can thus be quickly seen in terms of this average.

The lower solid curve shows the monthly shipments of casings and emphasizes the usually seasonal characteristics of the tire industry with the low demand of the early months rising to the peak in mid-year and well sustained through the fall.

The dotted curve, of monthly production, is sometimes above and sometimes below, but never in 1922 very far from that of shipments. Its average height above the zero base line is also approximately equal to that of the first horizontal ruling showing that shipments of the year were fully provided for out of new production with practically no material drafts on inventory at any time during the year. This fact is emphasized by comparing "accumulated shipments" with "accumulated production" since the first of 1922. At no time did shipments-to-date equal or exceed production-to-date.

The upper solid curve represents "availables"—the number of casings available for shipment—and its height above the zero base line is proportional to the stocks on hand at the first of the month plus the production of the month. The shaded portion therefore indicates by its varying thickness the number of casings in stock in excess of shipping demands. It will be noted that when the dotted production line falls below the line for shipment this excess decreases (the shaded strip, or cushion, becomes narrower) and vice versa.

Starting with the picture at the end of January, 1922, it is seen that the production was above shipments, the difference going into stocks which then totaled 4,155,000 casings, slightly less than two months' average shipping requirements. In February, March, April, and May, production was still maintained above shipments and at the end of May the excess of stocks over shipping requirements had expanded to over 5,500,000 casings.

June, July, and August showed a reversal with shipments slightly above production and in September they were about equal, with the result that the excess stocks, or "cushion" as it has been called, was decreased to 4,700,000 casings. Thereafter, with the exception of December, each month showed production topping shipments and the cushion increasing until at the end of June of this year it reached a total of 7,000,000 casings, or two and a half times the shipments of June, with production still running at the rate of practically three millions per month. It is worthy of note that in the four months out of eighteen when shipments exceeded production, the greatest drafts on stocks represented not over six per cent of the cushion.

[1] Consultant in analysis of business operations.

Similar conditions in reference to inner tubes are pictured in Fig. 2, except that slightly greater drafts on the cushion were made. In June, July, and August of last year these represented five months' requirements at the rate of shipping at that time. Practically no material drafts against the solid tire cushion were made in the entire period covered by the chart.

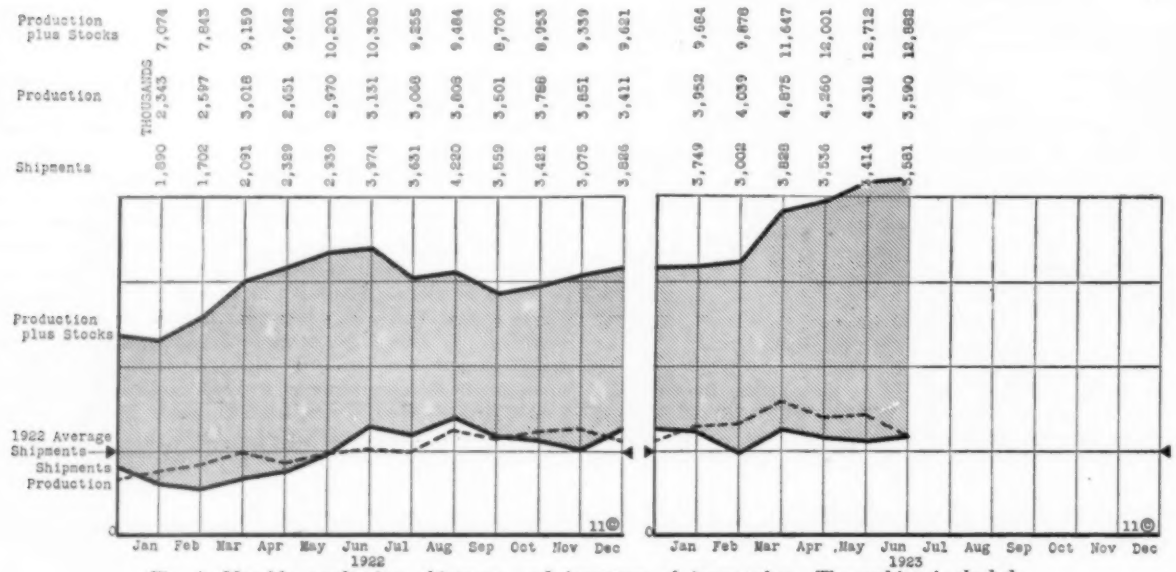


Fig. 2. Monthly production, shipments and inventory of inner tubes. The cushion is shaded.

respectively 13, 10, and 8 per cent of the cushion. On the other hand the cushion was expanded from 5,180,000 tubes at the end of January, 1922, to 9,300,000 tubes at the end of June, 1923, or two and a half times the shipments of the latter month, an increase of approximately 80 per cent in seventeen months.

Fig. 3, picturing the solid tire situation, shows even more strikingly this tendency to increase the cushion. In this case, January, 1922, shows the cushion representing approximately three months' average requirements, which by the end of June of the current year was increased to over 280,000 tires, or over

The facts cited above indicate the possibility of attaining a greater degree of stabilization of production schedules with the attendant economies, through a more effective use of the reserve stocks during the months of peak demand, replacing the drafts on inventory by somewhat higher rates of production in the early months of the year when consumption is lower.

To be useful to the individual producer in planning and stabiliz-

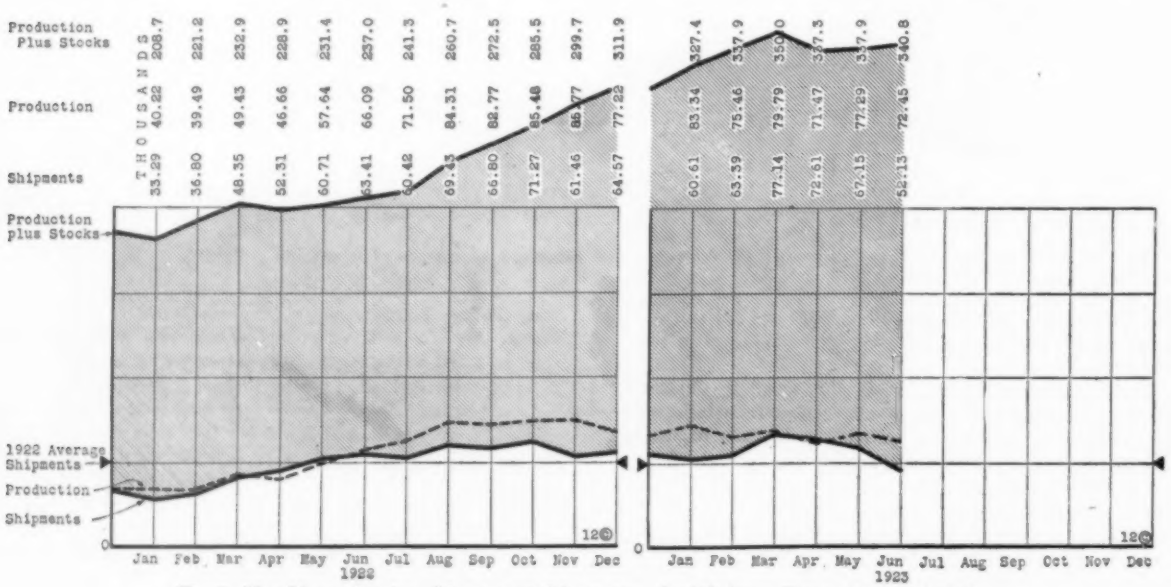


Fig. 3. Monthly production, shipments and inventory of solid tires. The cushion is shaded.

ing his production schedules the estimates of consumption on which such efforts must rest should be in terms of specific types and sizes. Fortunately the data of this character now available

in connection with graphic methods of analysis make it possible to secure such estimates six months in advance with an accuracy within a small percentage of subsequent accomplishment.

More extensive use of detailed information of this nature will not only reduce the investment in inventories, lower production costs, and improve labor conditions but will also tend toward more satisfactory producer-dealer relations. Dealers, on the other hand, may contribute very materially to the improvement of the industry by collection of the statistics of their own stocks and their sales to consumers, making these figures available to the tire producers and using them for their own guidance. Cooperation of this nature will lower the cost of doing business by keeping the combined stocks of dealers and producers at lower levels and more nearly in balance with the consumer demand.

Annual Meeting of the American Society for Testing Materials

The Twenty-sixth Annual Meeting of the American Society for Testing Materials, held at Chalfonte-Haddon Hall, Atlantic City, New Jersey, June 25-29, 1923, was the largest in the history of the society. The attendance reached the high mark of 1,051, compared with the largest previous total of 914, in 1922. There were 704 members in attendance or represented, 153 guests, and 193 ladies. The meeting was distinguished by the excellent attendance and sustained interest at all of the sessions.

Report of Committee D-11

In the absence of the chairman, F. M. Farmer, the report of Committee D-11 on rubber products was presented by the secretary, C. B. Martin. On recommendation of the committee, the Tentative Specifications for Rubber Gloves for Electrical Workers on Apparatus or Circuits not Exceeding 3,000 Volts to Ground (D 120 — 22 T) and the Tentative Specifications for Rubber Pump Valves (D 151 — 22 T) were referred to letter ballot of the society for adoption as standard.

The Tentative Specifications for Cotton Rubber-Lined Fire Hose for Private Fire Department Use (D 14 — 22 T) and the Tentative Specifications for Cotton Rubber-Lined Fire Hose for Public Fire Department Use (D 26 — 21 T), with revisions recommended in the report of the committee, were also referred to letter ballot of the society for adoption as standard.

The following proposed new tentative specifications were accepted for publication as tentative standards: For Wrapped Cold Water Hose, and for Rubber Matting for Use Around Electrical Apparatus or Circuits not Exceeding 3,000 Volts to Ground.

The revisions in the Tentative Methods of Testing Rubber Products (D 15 — 22 T) and the Tentative Specifications for Rubber Belting for Power Transmission (D 53 — 21 T), as recommended in the report of the committee, were accepted and the tentative standards as thus revised were continued as tentative.

Mr. Martin explained that the preprint of the report of the committee was in error with respect to the revisions of Table II in the Tentative Specifications for Wrapped Air Hose for Use with Pneumatic Tools (D 46 — 21 T) and asked that the following test pressures be substituted for those in the report:

700	625
675	600
650	575
625	575

With these changes the recommendation of the committee was approved and the specifications as thus revised were continued as tentative.

Two additional revisions in the Tentative Specifications for Braided Air Hose for Use with Pneumatic Tools (D 60 — 21 T), which had inadvertently been omitted in the preprint of the report, were presented on the floor of the meeting, as follows:

Section 9 (d).—Change from its present form: namely,

"The set, or permanent elongation, following a stretch from 2 in. to 9 in., shall not exceed 25 per cent."

to read as follows:

"The set, or permanent elongation, following a stretch from 2 in. to 5 in. in the case of the tube and from 2 in. to 7 in. in the case of the cover, shall not exceed 25 per cent."

Table I.—Change Table I on test pressures to read as follows by the addition of the italicized figures and the omission of the figures in brackets:

TABLE I.—TEST PRESSURES

INSIDE DIAMETER OF HOSE, IN.	TEST PRESSURE, LB. PER SQ. IN.
¾	[950] *800*
⅞	[925] *800*
½	[900] *800*
⅝	[850] *800*
¼	[750] *800*
1	700
1⅛	650
1¼	600
1½	550

The revisions in the specifications were accepted and the specifications as thus revised were continued as tentative.

On motion the report of the committee was adopted.

Report of Committee D-13

The report of Committee D-13 on Textile Materials was presented by its chairman, A. E. Jury.

The proposed Tentative Specifications for Imperfections and Tolerances for Cord Tire Fabrics; for Tolerances and Test Methods for Cotton Yarns and Cords; and for Tolerances for Hose Ducks and Belt Ducks, were accepted for publication as tentative standards.

The proposed revised Tentative Specifications for Imperfections and Tolerances for Square-Woven Tire Fabrics, submitted by the committee as a substitute for the present Tentative Specifications for Imperfections and Tolerances for 60-in. 17¼-oz. Square-Woven Builder Fabric (D 122 — 22 T), were accepted for publication as tentative.

The revisions in the Standard General Methods of Testing Cotton Fabrics (D 39 — 20) recommended by the committee were accepted for publication as tentative.

On motion the report of the committee was adopted.

New Officers

The following officers were elected for the ensuing year:

PRESIDENT (for one year): Guilliaem Aertsen, Bethlehem Steel Co., Inc., Chicago, Illinois.

VICE PRESIDENT (for two years): W. H. Fulweiler, Chemical Engineer, United Gas Improvement Co., Philadelphia, Pa.

MEMBERS OF EXECUTIVE COMMITTEE (for two years): J. H. Chubb, Manager, Service Bureau, Universal Portland Cement Co., Chicago, Illinois; T. G. Delbridge, Assistant Manager, Atlantic Refining Co., Philadelphia, Pennsylvania; H. L. Scott, Henry L. Scott and Co., Providence, R. I.; P. H. Walker, Chemist, U. S. Bureau of Standards, Washington, D. C.

The Extension Committee, having accepted the resignation of Vice President William H. Walker, appointed F. M. Farmer, chief engineer, Electrical Testing Laboratories, New York, N. Y., as vice president to fill the unexpired term of one year.

DURING THE MONTH OF MAY, AS IN JANUARY AND MARCH, Argentina easily outstripped other countries in her purchases of our canvas shoes with rubber soles, the May shipment including 114,200 pairs of such shoes, valued at $86,085. Cuba followed, with 94,507 pairs, valued at $59,493; Mexico took 46,978 pairs, valued at $43,280; and the Philippines, 50,462 pairs, valued at $38,537.

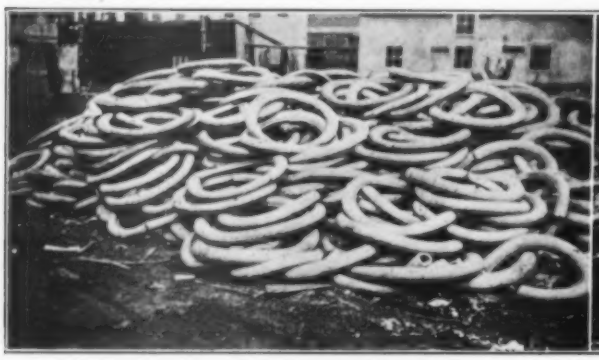
The Huge Rubber Scrap Surplus

Tonnage Volume Growing Larger—Increasing List of Discarded Waste—How to Utilize the Surplus

By K. C. C. R.

"THERE is practically no market for scrap rubber at present. Prices are low and reclaimers do not evince any buying interest," was THE INDIA RUBBER WORLD market report August 1, 1923. This condition should be a challenge to the research men. Reclaimers are quite busy; all rubber manufacturing lines are operating with seasonal normality, and yet millions of pounds of waste are being thrown away every day because no uses for them have been developed.

This does not mean that manufacturers are not utilizing reclaim to the best advantage. At the present market on crude, the substitution of more reclaim would be of no advantage either in the cost or quality of the product. And the tire industry, which consumes the greatest tonnage of crude rubber, cannot use much reclaimed rubber owing to the nature of the manufactured product. Some tread compounds call for 8 to 20 per cent by weight, and bead and flap compounds use a small tonnage which is negligible.



Air Bags Averaging Twenty Pounds Rubber Scrapped Because Insides Are Charred

Filling Marsh Land with Rubber Scrap Which Has No Other Use

Increasing Growth of Rubber Scrap Heap

The 1922 automobile registration was approximately 11,000,000 cars. Assuming 2½ tires as the annual tire consumption per car, 27,500,000 tires went into the scrap heap in 1922. Figuring the average weight at 10 pounds (it should be nearer 15 pounds) for the wornout casing, 275,000,000 pounds of scrap tires alone were thrown on the market. And the reclaiming consumption of all kinds of scrap for 1922 was only 154,211,594 pounds, an increase from the 1921 figure of 103,194,096, yet not approaching 1920 of 235,446,597 pounds, or 1919 of 230,985,216 pounds.

Considering all other grades of scrap—boots, shoes, hard rubber, inner tubes, mechanicals, and solid tires, and the cheaper grades which never reach the market—it can be conservatively estimated that not one-fifth of the scrap rubber supply is reclaimed or used by rubber manufacturers today. Consumption of scrap rubber was greatest during the years following the war, yet the peak was only 235,446,597 pounds in 1920.

Scrap with Low Rubber Content

The market report does not tell the whole story on rubber scrap. Every branch of the rubber industry has classifications of waste for which there is no market and which are in most cases thrown on the dump. Many of these are listed as follows:

TIRES: Bead overflow and trimmings—Rubber and fabric semicured; useless for reclaiming purposes owing to high sulphur content and low rubber yield. Cured flaps—Low rubber content. Uncured flap trimmings—Usable as a filler but unsalable. Cured beads—Cut from tires by reclaimers. Clincher tire—Not usable owing to high sulphur content. Straight side tires—Not usable for the same reason and the presence of the piano wire core. Air bags—Life taken out after so many cures; insides burned.

FOOTWEAR: Uncured wool clippings—Hard to reclaim owing to the presence of wool; only 33 per cent rubber yield; cannot be worked back into regular rag compound owing to bunching up of fiber. Heel overflow—Can be worked back into compound in small percentages, but surplus makes poor reclaim owing to low rubber content. Doubled tennis clippings when spread with rubber—Low rubber yield; less than 25 per cent. Cured shoe trimmings—Can be used for reclaiming but not attractive owing to better grades available. Special insolings—Cork, leather, compounded with rubber; cannot be separated.

CARRIAGE CLOTH: Cured and uncured trimmings, and old auto topping. Low rubber yield.

RAINCOATS: Old coats and trimmings, especially spreader work. Low rubber yield.

RUBBER HEELS AND SOLES: Overflow and defective heels. Used in sparing quantities by reclaimers and heel manufacturers themselves. Old fiber soles—No interest.

MECHANICALS: Small market, but practically no interest in the cheaper grades of cured owing to the low rubber yield. Electrical tape, belting, soft springs, valves, hose, packing, etc., cement wringers.

DRUGGISTS' SUNDRIES: No interest owing to small volume.

Automobile tires are rapidly falling into the above classifications. Auto tire reclaim has never had as wide use as shoe stocks on account of its toughness and non-flowing quality. It is not adaptable for spreader work or carriage cloth calendering. Scrap rubber dealers are hand picking tire scrap today and the only class which is salable at all is tires which have not delivered their full mileage and have a good percentage of the tread left on them. But even factory adjustment tires for reclaiming purposes are selling at less than one-quarter the price of scrap shoes. The large majority of them never reach the market at all, being thrown

on the city dumps by garage owners who are tired of cluttering up their cellars with them, or left by the roadside by the motorist when the last mile has been delivered and another shoe takes the place of the old one.

Crude Rubber Obscures Scrap and Reclaims

Another factor which is making the scrap pile grow larger constantly is the fact that the consumption of scrap is not keeping pace with the consumption of crude rubber. Consumption of crude rubber in 1922 increased 69 per cent over 1921, scrap consumption increased only 49 per cent, and reclaimed rubber 58 per cent. The following figures taken from the semi-annual reports of The Rubber Association of America, are informing.

	1921	1922
Crude rubber consumed	345,600,059	569,376,141
Rubber scrap consumed	103,119,831	154,211,594
Reclaimed rubber produced	76,508,725	120,484,853

In other words the rubber manufacturers in 1922 did not increase their use of scrap in the same proportion they increased the consumption of crude rubber. This is undoubtedly due to the greater amount of raw gum going into tires, in which mostly crude is used. The expansion in production of tires and tubes has been far above that in other sections of the rubber industry. This growth as explained in a previous paragraph has also augmented the scrap rubber pile to a point where present methods of reclaiming cannot possibly find uses for it.

Feasible Uses for Rubber Scrap

What is needed then is a new outlet for rubber scrap. What are the possibilities? The first field that comes to mind is the rubber pavement, which recently has been receiving world-wide attention.

Rubber scrap properly blended should make an ideal pavement owing to its cheapness and toughness, at the same time having enough of the resiliency of the original article. Semi-cured bead overflow which is useless for reclaiming purposes owing to its high sulphur content can be ground up, sheeted, and vulcanized in a press to make a hard, durable block. Auto tires might conceivably be devulcanized without extracting the fiber and vulcanized into slabs of larger dimensions. Scrap air bags might be utilized in the same way. These will sheet out readily as the 75 or 100 heats which they have been through have reduced them to a devulcanized state. In connection with bead scrap mentioned above, a cutting block composed of slabs of this material vulcanized in a press and clamped together has been used successfully. And cutting blocks are subject to more pressure and abuse than roadways. The block and slab methods are only suggestions. It is possible that the scrap could be applied directly to the surface of the road and vulcanized by external heat.

Roofing is another field where the use of scrap rubber might be employed. If the chemists can produce a compound that would age in sunlight, such rubber shingles could be produced very easily in sheet form. The field of building suggests all kinds of rubber scrap products, such as wall board, floorings, matting, etc.

The introduction of rubber paper in England suggests the possibility of using the many varieties of fabric waste coated with uncured compounds, now discarded because of the low percentage of rubber. If paper is made from rags why not rubber paper from rubberized cloth cuttings?

Drawing upon the imagination in another direction, why not rubber containers, such as pails, buckets, and shipping cases, made of scrap and vulcanized to sufficient hardness?

Shoe soles cut out from treads of discarded automobile tires have already been put into use in Germany and South America. The fiber sole could be improved in wearing qualities by the addition of more scrap.

Entering the field of dispersed rubber by W. B. Pratt's process, doubtless many grades of uncured scrap could be dispersed and a use found for them.

These are only a few of the possibilities. Certainly the volume of the scrap tonnage is increasing with such rapidity that the subject is worthy of much study and research to devise methods to utilize it. That the wise scoff and say that it is impossible makes it all the more probable.

Sheet Packings[1]

As classified by the engineer consumer, sheet rubber packings fall into four classes, as follows: (1) high pressure superheat packing generally guaranteed for all purposes; (2) red rubber packing for use on hot and cold water, low pressure steam and ammonia lines; (3) rubber with cloth insertion or cloth on the outside. This packing is useful for water lines only; (4) oil proof packing.

High Pressure Packing

This type of packing is suitable for high pressures and high heat. It is made of asbestos fiber mixed with a cement of rubber and fillers vulcanized under very heavy pressure. The asbestos fiber should be sufficiently long to give toughness, thus lessening the liability of the joint blowing out. The packing should not soften under the conditions of use, and when kept in stock should not get too hard. This packing is coming into more general use for all purposes.

Red Sheet Packing

Red sheet rubber packing is serviceable on hot and cold water, steam not exceeding 100 pounds pressure, and for gas and ammonia lines. It is relatively cheap and can be obtained over a wide range of prices.

A good packing of this type should not contain too much rubber, for in that case it will be too soft and as the bolts are tightened the packing will squeeze out between the flanges and necessitate repacking the joint in a very short time. In case too much filler and too little rubber is used the packing will be brittle and crack when bent double. Such packing will last but a short time. A good packing will not crack when bent nor harden when kept in stock.

Insertion Packing

Insertion packing is commonly made with an insertion of sheeting between two rubber composition plies, and sometimes brass wire cloth so placed as to hold the packing against blowing out.

Insertion packing can be had in three forms, known as C. I., or cloth insertion; C. O. S., or cloth one side; and C. B. S., or cloth both sides. The cloth holds the stock together. It is very good for the purpose for which it is intended but its field is limited and it should never be used on steam.

Oil-Proof Packing

The so-called oil-proof packings are generally black in color with a very high glaze finish, the object of which is to resist the softening effect of oil either hot or cold.

Where a joint is to be made which on breaking will cause the packing to adhere wholly to one face of the joint while the other breaks clean, it is customary to graphite or blacklead the face that is to break clean. This graphiting can be done on the job or the packing can be purchased with one or both sides graphited.

In all sheet packings the best thickness to use in most cases is 1/16-inch, or on highly finished surfaces 1/32-inch will serve. On old work where there is much wear or the surfaces are uneven ⅛-inch may be necessary. In general the thinner the packing the better the joint.

[1] Textile World, New York, N. Y.

BRITISH SOUTH AFRICA'S IMPORTATIONS DURING MAY OF OUR rubber belting and hose totaled $35,015 and $31,285, respectively. For the corresponding period Chile purchased rubber belting valued at $33,136, while our shipments to Mexico of such belting and hose totaled $28,051 and $22,581, respectively.

Plastimeter for Crude Rubber

By B. Marzetti[1]

In its manufacture crude rubber must be masticated, mixed, calendered, forced, and otherwise worked. The quality of the finished product depends, in greater or less degree, on the plastic resistance of the gum as it is subjected to these mechanical conditions. The physical properties of crude rubber, therefore, are nearly as important as those of its vulcanized products. Various testing machines have been devised for measuring the mechanical properties of cured rubber but very little has been done to perfect apparatus for mechanically testing crude rubber.

The matter of measuring the plasticity of rubber was brought up by Dr. De Vries at the meeting of the Rubber Division of the American Chemical Society at New York in September, 1921, and was included in the questionnaire distributed at his suggestion to American rubber chemists. Dr. De Vries' résumé of the replies received showed that the variability of plantation rubber, developed under mechanical working, was generally deplored but no suggestions were offered for measuring its plasticity or investigating the causes that influence this property.

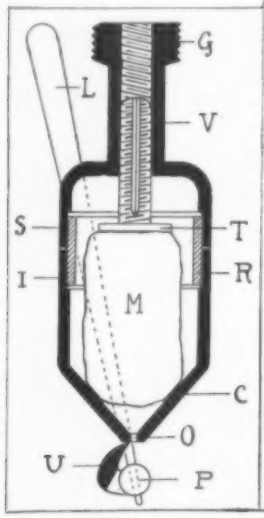


Fig. 1. Marzetti Plastimeter.

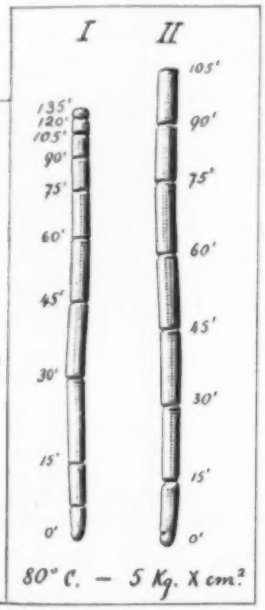


Fig. 2. Samples from Compounds I and II.

In studying this problem the author found that the commonly conceived penetration test in which a needle carrying a definite weight is made to penetrate a piece of crude rubber will not yield dependable results, although every precaution may be taken to secure uniformity in the testing conditions. Better results are obtainable when penetration tests are made on samples built up from calendered layers, yet they are unsatisfactory because the samples contain considerable quantities of minute air bubbles and the mass is under irregularly distributed internal strains. In order to obtain reliable data on plasticity it is necessary to operate with forces in comparison with which the tensions existing in the sample due to the last mechanical treatment may be considered wholly negligible.

A practical instrument for the measurement of the plastic quality of uncured rubber mixings is that devised by the author and described by Prof. G. Bruni in his remarks before the Rubber Division of the American Chemical Society at its New Haven meeting last April.

This instrument, in vertical section, is illustrated in Fig. 1. It consists of a strong metallic cylinder divided horizontally into two sections S and I which may be held together by a clamp not shown in the illustration. A rubber sleeve R, placed internally, renders the two-part cylinder airtight under pressure. The instrument is connected to a compressed air supply by means of the screw joint G at the top of the Pipe V in which is a screw, with a wide head T, that may be advanced more or less into the cylinder against the rubber sample M.

The cylinder has a conical bottom C provided with an outlet O at its apex. Below this outlet a curved blade U is pivoted at P and operated by a hand lever L.

In operation the uncured rubber compound to be tested is placed in the cylinder and compressed under the screw and against the opening O to prevent the escape of air pressure admitted to the cylinder for extruding the sample.

During the test the instrument is kept in a water or glycerine bath heated at a constant temperature. Thus, under fixed conditions of pressure and temperature, the rubber sample is extruded through the opening O. At given intervals of time the observer marks with a cut the extruding sausage by movement of the knife U against it. When the test is finished the long sausages of extruded rubber will be divided into a number of sections corresponding to the various intervals of time.

	Compounds	
	I	II
First latex crêpe	100	100
Zinc oxide	10	10
Sulphur	8	8
Thiocarbanilide	2	0
Organic accelerator	0	0.5

These compounds give approximately the same mechanical vulcanization in 15 minutes at 143 degrees C. At 80 degrees C. the rate of cure is considerably different for each. In fact the gradual shortening of the extruded stock in successive intervals of time from the moment of immersing the container in the heating bath may be taken as a measure of the vulcanizing process at that temperature. Actually, the slowing up of the extrusion as shown in Fig. 2, corresponds exactly to what is called the "scorching" of the compound.

It will be noticed that the amount of stock extruded in the first interval of time is less than that extruded in the second interval. This is because the mass of rubber requires a certain time to reach the temperature of the bath. It is therefore advisable not to consider the pieces which are extruded during the first period of time and to weigh only the pieces obtained following the first half an hour after immersion of the apparatus in the bath.

The apparatus described was devised by the writer four years ago. It has been in actual use for three years and has always given very satisfactory results. In a future paper the procedure to be followed in the use of this apparatus and the experimental data obtained will be given.

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[1]Physical Laboratory, Societa Italiana Pirelli, Milan, Italy.

REPLETE WITH INFORMATION FOR RUBBER MANUFACTURERS—H. C. Pearson's "Crude Rubber and Compounding Ingredients," also "Rubber Machinery."

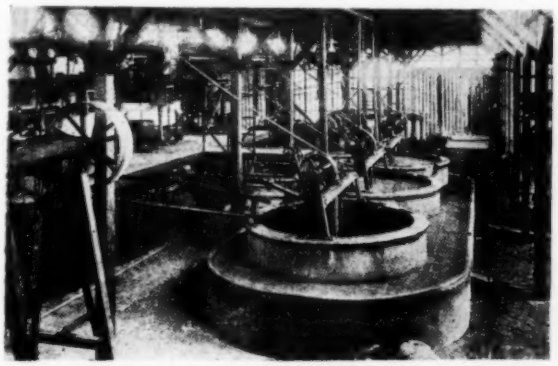
Tjipetir Gutta Percha Plantation[1]

History—Culture—Harvesting—Manufacture—Quality and Applications

History

THE long practiced native method of obtaining gutta percha by felling the wild trees has seriously depleted that source of supply and made necessary the establishment of plantation sources scientifically operated.

The first attempt to plant various kinds of gutta percha trees on a large scale was suggested by Dr. Burck, assistant director of the Botanical Gardens at Buitenzorg, Java. After experimental planting of various species, only the *Palaquium oblongifolium* and *Palaquium Borneense* are retained. These experimental plantings



The Tjipetir Factory. Here the Leaves Are Crushed

have grown to large trees and are the source of seeds in large quantities.

Government Estate at Tjipetir

From 1901 to 1906 over 1,000 hectares were planted at Tjipetir with Palaquium. Lack of knowledge in their cultivation seriously delayed the development of the trees for several years.

The advent of wireless telegraphy seriously threatened gutta percha production, and caused a sharp decline in its price, and lessened interest on the part of the Netherlands Government in its cultivation. At this time tapping of trees planted previous to 1901 had started, but it soon appeared that the business would not be successful on a tapping basis.

Efforts to extract gutta percha from the leaves by chemical means resulted in a product of inferior quality and this method was soon abandoned and a better process sought for obtaining the gutta percha by a system of mechanical extractions.

A Singapore factory had been working on mechanical extraction since 1897 but having no plantation was dependent for its supplies of leaves in the jungles of Sumatra, Borneo, etc. The increasing distances and proportionate costs became prohibitive and practically contributed to the extinction of the gutta percha trees of those districts.

There were also some small factories in Borneo and the Malay Peninsula which worked partly by mechanical means and partly by a chemical process, but through lack of supplies of leaves remained of small importance.

Culture

It has been learned by experience that the best form of tree for obtaining gutta percha by tapping is a trunk of sufficient length without low branches, while for leaf gathering a shrub-like type is needed with well-developed low branches which can be increased by pruning.

It is imperative that no leaves should fall to the ground and be lost to the harvest, so the enriching of the soil should be done artificially.

Harvesting

There are two ways of harvesting—by pruning and by plucking. By pruning, which takes place once in two or three years, the trees are kept shrub-like, the higher branches being cut off, and by judicious treatment development of the lower branches is promoted.

The harvest consists of all of the leaves, old as well as young, including the sappy ends of the twigs, as these contain a great quantity of gutta percha; also the bark of the branches, the thicker twigs, and the thin young twigs. Plucking takes place at regular intervals about four times a year, when only the old leaves which are likely to drop off are harvested. By this method, if great care is taken not to pick the young leaves, the damage done to the plants is only slight. The shrub-like plants are pruned in such a way that the laborers can easily reach the leaves while standing on the ground.

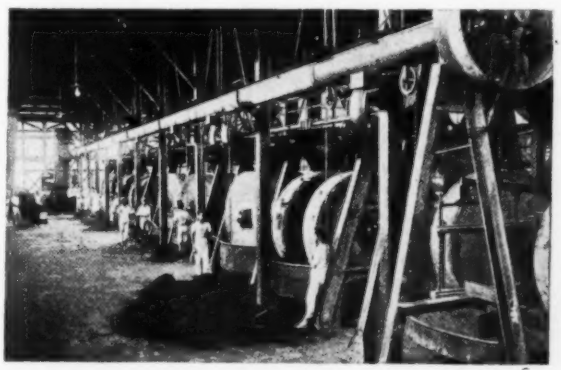
Manufacture

The factory building measures about 90 by 300 feet with an upper story in which the leaves are collected. The power is hydro-electric of 450 h. p. with a current of 6,000 volts. Steam boilers supply hot water for the extracting process, and steam for the stills and purifying the product in the washing and kneading machines.

Leaf Extraction

Gutta percha occurs in the leaves in separate latex vessels. Almost immediately after the leaves are plucked the gutta percha coagulates to very small threads, which may be seen by breaking the leaves. The leaves as received are stored on the upper floor of the factory where they are thinly spread out to prevent fermentation, following which extraction is done by a purely mechanical process without addition of chemicals.

Two machines are used for cutting the leaves into pieces of



The Tjipetir Factory. Here the Gutta Percha Is Extracted from the Crushed Leaves

medium size. Afterwards they are passed through special grooved rollers to crush them but not to a pulp. They are then ground to a fine meal in edge runners of relatively small capacity to break up the leaf tissue yet not breaking the gutta percha threads, otherwise perfect gutta percha flakes can not be formed. The

[1] From "The Netherlands Indies Government Gutta Percha Estate, Tjipetir, Java," by H. Van Lennep.

motion of the edge runners give a friction movement and not a cutting one, which causes the threads to remain intact.

Elevators and screw conveyors are used for moving the leaves through the various stages of the process.

The leaf meal is mixed with a certain proportion of hot water in a steam jacketed still containing a paddle wheel. The latter stirs the mass into a thin, seething mixture, the temperature being meantime gradually raised to 70 degrees C. Under this treatment the fine gutta percha threads are loosened from the fiber of the leaf tissue and become plastic by the increased temperature. The intense agitation causes them to adhere together, forming small flakes, while the leaf tissue is water soaked. The boiling requires experience and attention to secure flakes as fine as possible.

After boiling, the whole mass is run into large tanks of cold water provided with strong agitators. The water-soaked leaf fiber sinks to the bottom while most of the gutta percha flakes rise to the surface and are easily skimmed off. A portion of the flakes to which some fiber adheres remains suspended in the water or sinks with the bagasse. By agitating the mass several times these flakes are further purified and caused to rise to the surface.

Final purification of the gutta percha flakes is accomplished in power washing machines and the refined product before shipment is consolidated into blocks in hydraulic presses.

Comparison with Wild Gutta Percha

In general the mechanical properties of purified gutta percha depend upon the percentage of gutta and resin. In judging it, tensile strength is of first importance, followed by elongation, hardness, resistance to wear, flexibility, and plasticity.

Tjipetir gutta percha when compared with other sorts and balata, has a very low percentage of resin and accordingly an extremely high tensile strength. It is very hard and durable, has little flexibility and unlike other sorts will not so quickly become plastic at high temperatures.

Chemical analyses of two samples of gutta percha from Tjipetir were as follows:

	I	II
	Per cent	Per cent
Moisture	5.1	3.5
Resin	6.4	7.3
Ash	1.6	1.2
Dirt (not soluble in xylol)	12.7	10.4
Gutta percha (calculated)	75.8	78.8

Applications

Some of the uses to which leaf gutta percha can be applied are: insulation, golf balls, chemical apparatus, medical articles, belting, etc. By suitably compounding Tjipetir gutta percha it can be rendered as flexible as balata without influencing its durability, and its physical and chemical qualities are equal to those of purified balata.

Foreign Tariffs

The Rubber Division, Bureau of Foreign and Domestic Commerce, Washington, D. C., has recently issued the following special circulars regarding foreign customs tariffs:

Circular No.	Country	Articles
212	Norway	Rubber Goods
220	Austria	Rubber Goods
231	Brazil	Rubber Goods
232	Guatemala	Rubber Goods
233	Panama	Rubber Goods
234	Palestine and Syria	Rubber Goods
236	Honduras	Rubber Goods
238	St. Pierre and Miquelon	Rubber Goods

Further particulars may be obtained from the Foreign Trade Bureau of THE INDIA RUBBER WORLD, 25 W. 45th street, New York, N. Y.

Rubber Trade Inquiries

The inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The Editor is therefore glad to have those interested communicate with him.

(242) A prospective purchaser wants to get in touch with manufacturers of pasteboard or wood tire stands for window displays.

(243) We are asked to advise where balloon tires may be secured.

(244) Information is desired concerning ribbing machines for grooving plain tires.

(245) A reader is interested in locating a firm that will polish a number of hard rubber samples.

(246) We are asked where decimal timers for time study work may be obtained.

(247) A correspondent in Hungary wishes addresses of American manufacturers of the following compounding ingredients: magnesia, magnesia carbonate, zinc sulphide, golden sulphur or sulphurets of antimony, sulphur, lithopone, lampblack, and cotton flock.

(248) Prospective builder of a cotton fabric plant desires addresses of manufacturers of tire fabric machinery.

(249) A correspondent in Spain desires to purchase a number of alarm gages for rubber works.

(250) We are asked for addresses of firms who do proofing.

(251) Addresses are desired of rubber stamp press makers.

(252) We are also asked where rubber cement and sheet rubber may be procured.

(253) An inquiry comes from the Belgian Congo for price on cups for collecting latex.

(254) A correspondent wants to purchase a machine to cut inner tube stock into strips 3/16 inch wide and about 24 inches long.

(255) We are asked for a list of Detroit auto top manufacturers.

(256) Information is desired as to a machine for breaking up solid tires so that they may be put through a cracker.

Foreign Trade Opportunities

Addresses and information concerning the inquiries listed below will be supplied to our readers through the Foreign Trade Bureau of The India Rubber World, 25 West 45th street, New York, N. Y. Requests for each address should be on a separate sheet and state number.

NUMBER	COUNTRY AND COMMODITY	PURCHASE OR AGENCY
7302	Persia—Tires and rubber goods	Agency
7312	Switzerland—Self-vulcanizing and self-cementing patches for bicycles	Purchase and Agency
7322	South Africa—Tires for automobiles, motor cycles, and bicycles	Agency
7336	Syria—Tires and rubber goods	Agency
7375	Spain—Tires and tubes	Agency
7387	Italy—Boots and shoes employing rubber, also tires and tubes for automobiles, and tires for bicycles and motor cycles	Agency
7440	Poland—Tires and tubes	Purchase and Agency
7464	France—Rubberized clothing, druggists' sundries, etc.	Agency
7478	New Zealand—Tires and tubes	Agency
7514	India—Tires	Agency
7515	Poland—Tires and shoes of Russian type	Agency

UNITED STATES OUTPUT OF CARBON-BLACK INCREASES

The quantity of carbon-black produced in the United States from natural gas amounted in 1922 to 67,795,000 pounds, over 13 per cent more than in 1921, according to reports made by the Geological Survey. Practically all the product of the year, and in addition between 12,000,000 and 15,000,000 pounds held in storage, was required by the tire industry, which finds carbon-black an invaluable ingredient in tire manufacture.

Practical Testing of Crude Rubber

By Dr. O. de Vries[1]

IT is a rather striking fact that in many rubber factories more attention is paid to the control and testing of pigments, fillers, etc., than to rubber—the chief raw material. The reason is not far to seek. On some points our knowledge of rubber has reached a high state of development, and properties such as rate of cure and tensile strength are now well understood and can be tested and studied in a quite satisfactory manner. But on other points such as plasticity, flowing capacity, etc., our scientific knowledge is still very deficient, and suitable methods of testing have not yet been worked out. Rubber testing, even if the most up-to-date methods and data are used—which means a well-trained technical staff, not overburdened with other work—at its best only gives a control over certain groups of properties such as the vulcanizing properties, but leaves others such as milling, mixing, and flowing quite untouched, and therefore is unsatisfactory to the practical man. Fortunately our knowledge of rubber is growing with rapid strides by the combined efforts of rubber chemists all over the world, and it may confidently be expected that the present difficulties will soon be overcome so that the testing of raw rubber can take the place that it deserves.

Adequate testing of crude rubber is of as much importance to the high standard producer who wishes the care he takes in preparing his product to be known and acknowledged, as to the consumer who benefits by high and uniform quality or pays the penalty for unexpected shortcomings in the raw material.

Sampling

A first and seemingly very obvious but still not superfluous suggestion would be that the man who will be responsible for the report on the rubber shall inspect the whole lot himself and if possible control the sampling.

The monthly output of an average estate is about 15 to 20 tons first grade; large consignments, especially when bought far from the original markets, nearly always consist of a number of smaller lots from different estates. Moreover, not unimportant amounts of "standard" and "off grade" are sorted, mixed and repacked by dealers; such lots can mostly be recognized easily enough at a closer inspection by the differences in the pattern, size, and thickness of the sheets in one case, or by the differences in color, breadth, and structure of the crêpe.

A little attention paid to the marks on the cases will easily allow one to sort the consignments into different lots. If the variety of marks on the cases is found too bewildering, a closer survey of the contents may still prove very useful. In the same way, an inspection of the different cases of one lot will reveal whether the lot is homogeneous and if not, of how many different types it is at least composed. Taking one sample or a few at random is practically useless as it discloses the properties of only part of the lot. The sampling should be done according to the degree of homogeneity of the lot, and according to the use to which the rubber is going to be put as a whole or split up for different purposes. By careful inspection of the raw rubber, paying due attention to the marks on the outside of the cases and to the exterior appearance of the rubber, and by basing thereon the way in which the contents of different cases have to be mixed, a constant supply may be obtained from day to day, and the chemist may often obviate a great deal of trouble in the factory.

In all testing work the sampling and inspection of the material is the principal point, and the testing itself should take only a second place; and this certainly holds for plantation rubber, which comes from several thousand different estates.

Chemical Testing

Though vulcanization testing certainly is the most important part, simple chemical analyses may give valuable indications and perhaps deserve more attention than at present. As a relic from old times when wild rubbers played an important rôle, the extraction with acetone still takes a first place in the mind of many rubber chemists; but for normal plantation rubber the variation in acetone extract is only small and not related to any important property, so that the conclusions to which this figure may lead do not seem to be of much value.[2]

The ash, on the contrary, might play a more important rôle than at present, especially when doubtful types of sheet or blanket from the East are to be tested. Coagulation with alum, which causes abnormally slow vulcanization and is, furthermore, a sure indication that native or inferior Chinese rubber is present, is most easily detected by an ash determination, figures of 0.5 or higher being found in such cases. A further examination of the ash (treatment with acids, microscopic examination) teaches the amount of sand or grit, and eventually may furnish the positive proof that alum was present. The ash content of first grade plantation rubber is 0.25-0.30 per cent; rather high figures point to the use of undiluted latex in coagulation, low figures such as 0.20 to 0.15 indicate coagulation from very dilute latex, rainy days, etc., generally accompanied by a somewhat slower cure.

The watery extract (obtained by heating on the waterbath 3 g. of the finely cut sample with 100 cc. of distilled water for 6 hours, heating the residue for 2 hours with a fresh portion of 50 cc., evaporating the extract to dryness and drying at 100 degrees C) may also give indications as to the method of preparation, a lower figure being found the more the rubber has been treated with water during preparation.[3] Further research will have to show whether the water treatment during preparation is or is not one of the causes of differences in plasticity of the crude rubber, but the watery extract is one of the ways to gain some insight in the method of preparation which should not be neglected.

Vulcanization Testing

The methods of testing crude rubber used in the Central Rubber station[4], have been worked out so as to obtain a high degree of accuracy, as is necessary for a testing station of a public character, the reports of which may have to pass from hand to hand. Rubber testing in a rubber factory can be conducted along simpler lines. In several cases the only aim is to decide whether a certain rubber is fit for a certain manufacturing purpose, or for what class of goods a certain lot shall be used. Testing in a mixture very similar to the factory mix is then resorted to and the actual figures are not of so much importance as the conclusion "up to the purpose,"—or not. In other cases the chemist will have to go deeper into the question; but it is not too much to say that the methods at present used, though often very elaborate, do not always give as clear an insight as might be possible with our present knowledge, nor is the often large amount of testing figures always used to the greatest advantage.

For instance, one mix is often given a number of cures, some-

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[1] Director, Central Rubber Station, Buitenzorg, Java.

[2] The statement of S. S. Pickles (Rubber Age, London, Vol. II., 545, 556) that the acetone extract gives valuable indications as to the behavior in a mixture containing lead oxide has not yet been proved by figures but deserves attention.

[3] De Vries, "Estate Rubber, Its Preparation, Properties and Testing," p. 612.

[4] *Ibid.*, chap. XVII and XVIII.

times five or even ten. Now tensile strength and rate of cure, if these properties are taken in a well defined sense, may be determined by one appropriate cure or at the most by two, a trial and a final vulcanization. Making a series of cures with one mix is only useful to determine the "broadness of peak," the way in which the tensile strength changes with overcure. This broadness of peak is certainly a most important property in the study of different compounds, which one naturally desires to be as foolproof as possible. Perhaps it may also be of importance when comparing different types of rubber, for instance plantation with hard fine, since for the latter a broader peak is claimed, though figures which prove this contention have not yet been published. But there are no indications that ordinary plantation crêpes or smoked sheets differ considerably in broadness of peak, and it would seem useless to make a series of cures with one mix when simply testing first grade crude plantation rubber.

Making the same total number of cures, but one with each of a number of samples from the same lot, would give a valuable indication as to the degree of uniformity in rate of cure, a property which it is of more importance to determine in plantation rubber than broadness of peak, but for which no appropriate tests are made in many laboratories. Taking 10 to 20 samples from one lot of rubber, mixing each separately with sulphur (say 100 to 8), curing these mixes together and comparing the curves obtained after such a cure (for instance, the loads at a fixed length, or the lengths at a fixed load), very easily gives an insight into the degree of variability in rate of cure and teaches whether the lot is homogeneous or whether a careful mixing of the contents of different cases is necessary to make sure of a uniform supply.

For determining the rate of cure and the variability in rate of cure, the pure rubber sulphur mix is now generally acknowledged as the most suitable. We would like to lay stress on the point that in such testing one cure for each mix should be sufficient, but a large number of samples should be taken from one lot, which may then be cured together to determine the variability in rate of cure.

For determining the tensile strength, some prefer to take test mixtures containing other compounds; and, as in this case one wants to know the average figure, an average sample can be used, obtained by thoroughly mixing a number of samples from different cases.

The above simple test for uniformity (comparing the lengths at a fixed load for a number of samples cured together) is made somewhat inconvenient by the fact that the straight, dumbbell-shaped test piece is so generally used in America, because this type of test piece does not allow more than a very rough reading of the length or elongation. It is not easy for one eye to follow the upper mark on the test piece while the other eye has to follow the lower one some 8 or 9 inches away. Moreover, the original marks during stretching extend to a blot of ¼ or even ½-inch breadth so that accurate reading of the elongation is impossible. The consequence is that the elongation is generally only given in inches and halves, say 8, 8½ or 9, so that one reads in percentage of the original length only the figures 800, 850, 900, etc. With a Schopper machine and ring test pieces the elongation is read in units (for instance 800, 801, 802, etc.), and one is quite sure of differences of 5 per cent in length or less, while with the straight test piece only the 50's are read.

Now 50 per cent elongation in a rubber sulphur mixture means 10 to 15 per cent difference in time of cure. For a properly uniform rubber a variability of not more than 10 per cent is stipulated by those manufacturers who have studied the question of how uniform the best grades of plantation rubber should be; and it will be clear that the testing method has to give figures for elongation much more accurate than are now mostly obtained with straight test pieces, if one wants to be able to determine differences of 10 per cent or less in rate of cure.

Moreover, the ring test piece enables one to record the curves graphically, which is a more accurate and much quicker way of obtaining the form of the curve than by plotting elongation against load, and makes it possible to work the machine with one operator instead of two. The original theoretical objection against ring test pieces, namely: that the outer circumference of the ring is stretched to a percentually smaller degree than the inner one, seems of no practical importance,[5] and surely does not counterbalance the disadvantages of the straight test piece.

Of course we know that improved methods of testing with straight pieces are in use here and there, but at all events it would seem desirable that a critical study be made of the testing methods at present in use and that they be revised where necessary so that the highest degree of efficiency may be reached. Routine testing is only of value if based on adequate methods, and in research work so many important problems urgently await solution that only the best methods and apparatus should be used, so that no time is lost in collecting unnecessary or inaccurate figures.

The Government's Rubber Expert

Harry Nichols Whitford, Ph. D., the able chief who presides over the activities of the Crude Rubber Section, Rubber Division, Bureau of Foreign and Domestic Commerce, Department of Commerce, Washington, D. C., is a native of Manhattan, Kansas, where he was born in 1872.

H. N. Whitford

His higher education was begun at the Kansas State Agricultural College where he received his B. S. C. degree in 1890. An ardent student from the outset, he soon began to specialize in biology, botany, and forestry, and his life has been that of a teacher and investigator as the scope of his studies broadened. From an instructorship in biology at Armour Institute in 1899 he went the following year to the University of Chicago to assist in botany, and in 1903 took his Ph. D. degree there.

The following year he entered government service as botanical collector, Bureau of Government Laboratories, in the Philippines, and from 1904 to 1911 he was forester and chief of the Division of Investigation, Bureau of Forestry. During that time his investigations included rubber growing possibilities not only in the Philippines but in the Federated Malay States, Borneo, and India.

From 1912 to 1915 he served as forester to the commissioner of conservation of the Dominion of Canada, and during that time investigated forest conditions in British Columbia. In 1915 he became a member of the faculty of the Forest School of Yale University and has since pursued his explorations in many countries of South and Central America. Numerous publications have been issued concerning his investigations in Brazil, Colombia, Venezuela, Dutch Guiana, Honduras, Guatemala, and Mexico.

With this extensive field experience in the principal rubber producing countries of the world he is especially well equipped for his present executive work as the government's rubber expert at this time when an adequate crude rubber supply is engaging the serious attention of American rubber goods manufacturers.

Mr. Whitford is a fellow of the American Association for the Advancement of Science and a member of the Ecological Society of America, Society of American Foresters, and the American Foresters' Association. His clubs include the Cosmos Club, of Washington, D. C., and the Graduates Club, of New Haven, Connecticut.

[5] "Estate Rubber, Its Preparation, Properties and Testing," p. 523.

What the Rubber Chemists Are Doing

Limitations of Obscuring Power Method of Determining Particle Size of Pigments[1]

By Ellwood B. Spear and Herbert A. Endres[2]

THE so-called obscuring or diffusing power test is a turbimetric method of determining the average particle size of pigments, and has been previously described in the literature.[3, 4] The fundamental principle of the method is the extinction, partly by absorption, partly by scattering, due both to refraction and reflection, of the direct light rays from the incandescent filaments of an electric lamp caused by the dispersed pigment particles in the tube through which the lamp is viewed. The chief factors involved are the size of the particles, the difference of refractive indices of the dispersed material and the disperse medium, the absorption of light by the particles or by the medium, and also reflection from particles, depending upon the angle presented to any ray. The importance of the difference of refractive indices of the dispersed phase and dispersing medium should be stressed, because if both phases have the same refractive index there will be neither refraction nor reflection and the system will appear homogeneous and entirely transparent. Obviously, in this case an obscuring power reading could not be obtained.

The apparatus employed is essentially a Sargent colorimeter. Briefly, the obscuring power in square centimeters per gram is obtained by dividing the reciprocal of the concentration of the suspension in grams per cubic centimeter by the height of the column in centimeters. Multiplying the value thus obtained by the specific gravity of the suspended material gives the obscuring power in square centimeters per cubic centimeter.

The obscuring power method depends upon the property which the particles have of cutting off light rays. It is obviously impossible for particles to do this completely unless they can form a true geometric image of themselves. It is clear, therefore, that the obscuring power method cannot give quantitative results where the diameter of the particles is less than that necessary to form a true geometric image. For this reason the obscuring power method is totally inapplicable for the determination of particle size in colloidal systems. The same argument obtains in the case of the best pigments, such as very fine zinc oxide and gas-black.

Visible light is composed of light waves varying in length from 4,000 to 7,000 Angstrom units, or 0.4 μ to 0.7 μ. It has been found that, for any given wave length, particles less than one-fourth wave length in diameter do not appreciably affect the wave front. Therefore, particles less than 0.1 μ in diameter will not affect even the shortest light waves, and the obscuring power method would not be expected to give accurate quantitative results with particles less than 0.175 μ in diameter.

The authors' experiments with colloidal gold demonstrate that the obscuring power increases with the particle size until a maximum value is reached, after which it decreases with increasing particle size.

Application to Blacks

Mix 50 mg. of the material into a few drops of glycerol in an agate mortar. After the pigment is thoroughly wet add 0.1 g. of solid tannin and continue trituration for 5 min. Use solid tannin instead of a solution, because it is essential to keep the original trituration mixture as concentrated in pigment as is possible for complete dispersion. Then add water, 2 cc. at a time with titration after each addition, until 10 cc. have been added. Transfer the mixture to a 250-cc. volumetric flask, add about 100 cc. water and shake thoroughly, after which fill the flask to the mark and shake again. Should the mixture foam badly it can be settled by adding a few drops of ether. Transfer 25 cc. of this dispersion to a 100-cc. volumetric flask and fill to the mark with water. After thoroughly shaking this mixture obtain the obscuring power reading in the usual way.

This method fails to give satisfactory results with gas-black, which usually contains a considerable proportion of particles less than 0.10 μ in size and particles of less than one-fourth wave length will not appreciably affect even the shortest light waves. The method gives satisfactory results, however, when applied to coarser carbon pigments, such as lampblack and graphite.

Application to Zinc Oxide

Mix 0.5 g. of the material thoroughly with a few drops of glycerol in an agate mortar. To this add 10 cc. of a 1 per cent solution of gum arabic in water and continue trituration for about 5 min. Transfer the mixture to a 250-cc. volumetric flask and treat as in the case of gas-black.

The obscuring power method is generally applicable to the usual grades of zinc oxide.

Application to Other Pigments

The method has been tried out with several other pigments and is applicable to all the present day commercial pigments with the exception of gas-black and some grades of antimony pentasulphide, and iron and zinc oxides. With pigments containing particles less than 0.1 μ in size the method is not quantitative and becomes less so as the proportion of these increases.

Summary

The method is applicable for comparisons of particle size of the same pigment in the same medium where the average diameter of the particles is greater than one-half the wave length of light. It serves as a convenient and rapid check on the physical condition of two shipments of the same material produced by the same process even when the average diameter of the particles is somewhat less than one-half the wave length of light.

The method, however, is not applicable for the comparison of two different pigments if an appreciable difference exists between their respective refractive indices, or other optical properties, such as light absorption and reflection. For instance, zinc oxide and gas-black will not give the same obscuring power values, even if the average diameter of the particles is the same in the two cases. It is not applicable for the determination of particle size in systems where the diameter of the particles is less than one-fourth the wave length of the light employed—i. e., in colloidal systems.

Development of the Plantation Industry

At a meeting of the Institution of Rubber Industry held in London Dr. H. P. Stevens spoke on the current practice of preparing plantation rubber. Following is a brief outline of the lecture:

The basic modes of preparing rubber are essentially the same as those adopted by the pioneers 20 years ago. It is now recognized that the severity of tapping affects the composition of the latex, and the intensive system is being replaced by tapping on alternate days or even at less frequent intervals, that is, every four months. Latex is now collected in glass, glazed earthen-

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[1] Presented before the Division of Rubber Chemistry at the 64th Meeting of the American Chemical Society, Pittsburgh, Pa., September 4 to 8, 1922.
[2] The Goodyear Tire & Rubber Co., Akron, Ohio.
[3] Journal of Industrial and Engineering Chemistry, 12, 1920, 890.
[4] THE INDIA RUBBER WORLD, 65, 1922, 347.

ware, or aluminum cups, and sodium sulphite (1 part to 500 or 1000 of latex) is added to prevent coagulation before the latex is strained. Acetic acid is used as coagulant, the latex having been previously bulked and diluted in large tanks (small pans, if crêpe is to be made) in order to secure a product uniform in appearance and properties; usually the latex is diluted to a rubber content of 1.5 to 2 pounds per gallon.

There has been no change in the method of preparing blanket crêpe, except that in Ceylon hot air or vacuum driers are frequently employed, drying in ventilated sheds being used in the Federated Malay States. For making thick crêpe, hot air driers are now in use in the Malay States, as air dried crêpe is hard and cannot be milled readily into blanket crêpe. Great care is taken to ensure that the rubber is dry before packing, but sheet rubber often shows traces of mold on arrival in Europe, owing to the presence in the rubber of water soluble organic substances. Most of the impurities found in rubber by the manufacturer are due solely to contamination during unpacking, sampling and repacking.—*Journal of the Society of Chemical Industry.*

Modified Blacks[1]

So much has been heard of impending restrictions on the use of natural gas for the manufacture of black that attempts at modified processes are not surprising. In view, however, of the great difference between gas-black and lampblack, and the possible variation in the character of gas-black itself obtained under different conditions, the products of such modified manufacturing processes are not necessarily identical with one another.

The use of natural gas from which condensable constituents have been more completely stripped, enables an increase in the production of gasoline, but is unfavorable to the yield of black. Apart from this, such an alteration in the process is likely to affect the character of the resulting black. Black, stated to be prepared from such gas, was strikingly different from ordinary carbon black, and also from lampblack, even in its obvious physical characteristics. In color it was lighter than either, and it appeared to be lacking in the fineness of particle characteristic of these materials.

Acetylene Black

Gas-black today is also being produced commercially by the incomplete combustion of acetylene. Whether such combustion is effected by explosion with insufficient air for complete combustion or by allowing the flames to impinge on a solid surface, the effect involves combustion of part of the acetylene with thermal decomposition of the remainder by the heat so produced. The product is of distinct characteristics from gas-black and lampblack.

Coke the Source Material

An interesting feature of black manufacture by this method is that the raw material is coke, which, via calcium carbide and acetylene, is converted into finely divided amorphous carbon. In other words, this alteration in the physical condition of the element carbon is effected by a complex series of chemical changes, but with a type of raw material of which the supply should be well nigh inexhaustible.

Novel Possibility in Black Stocks

These chemical considerations recall another possibility, namely, that of producing the amorphous carbon inside the rubber itself, thereby obviating the undesirable mill method of introducing black and simultaneously insuring superlatively fine distribution of the carbon. Certain organic substances are known capable of decomposing fairly easily with liberation of carbon and doubtless more convenient instances will yet be discovered. By incorporating a suitable compound of this character in a rubber mixing it might be possible to produce the carbon *in situ* during vulcanization.

The carbon thus produced in a nascent condition inside a colloid medium would be in an exceptionally desirable form for reinforcing the surrounding rubber. Such a process indeed may later become a standard manufacturing operation of the rubber industry. Indeed, it may be hazarded that the wonderful effect of vulcanization itself is actually due to the analogous production of a compound of sulphur and part of the rubber in an exceedingly finely dispersed condition throughout the remainder of the rubber mass.

[1] From "Rubber Pigments." By D. F. Twiss. A paper read before the Institution of the Rubber Industry, London Section, April 9, 1923.

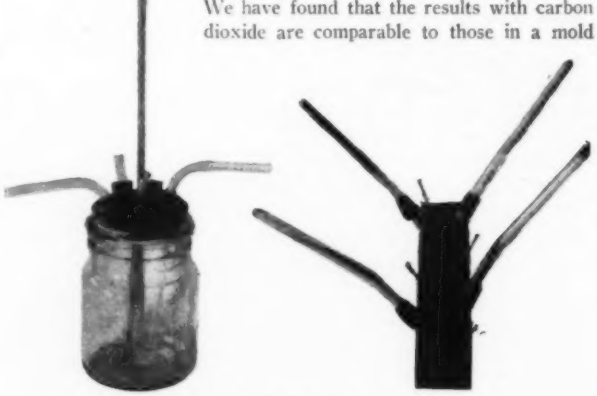
A Laboratory Burning Test for Accelerators[1]

By Sidney M. Cadwell and O. H. Smith[2]

An accelerator's resistance to premature vulcanization or burning on the mixing mill is perhaps its most important characteristic from a commercial point of view. Heretofore it was necessary to determine the burning time of an actual mix on factory rolls in order to obtain reliable data. We have developed a convenient, accurate, burning test that can be carried out with a few grams of material in a beaker. Almost any vulcanization can be studied by the same method. This is particularly valuable for laboratory tests on accelerators.

Briefly, the compounding constituents are mixed in cement instead of by means of a mill roll, and a film of rubber obtained by dipping is cured in carbon dioxide instead of in a press. The extent of the cure is determined by qualitative examination at definite intervals. In this way accelerators can be arranged in the order of their curing speed at milling temperatures. It has been demonstrated that this is usually the order of their burning speed on the mills. We carry out the test as follows:

A benzol cement is made up of 100 parts of pale crêpe, 10 parts of zinc oxide, 3 parts of sulphur and 800 parts of benzol. To a portion of this is added the accelerator to be tested, either in the form of a benzol solution or as a suspension. 8 mm. glass tubes are dipped into the cement until a film about .015 of an inch thick is obtained. A fruit jar is fitted with a stopper provided with several openings which will hold the glass tubes. After the films are dry, the tubes are inserted in the fruit jar and held in place by the stopper as shown in the illustration. Whenever a tube is removed for examination it is replaced by a stopper, so that the vulcanization of the remaining tubes is not interrupted by the loss of hot gas. The fruit jar is placed in an oil bath and carbon dioxide is run through it slowly. The thermometer records the temperature right beside the pieces of rubber being tested. In this way the films of rubber are heated for any desired time and temperature in an atmosphere of carbon dioxide. We have found that the results with carbon dioxide are comparable to those in a mold



Apparatus for Testing Accelerators

or on the mill, but if air is used oxidation is very bad on these thin films.

If the burning characteristics of the accelerator are being tested the temperature is maintained at 212, 230, or 248 degrees for

10, 20, 30, 40, or 50 minutes. An accelerator which burns badly will give a distinct cure in 30 minutes at 212 degrees. An accelerator which does not burn badly, will give no distinct cure in 50 minutes at 248 degrees. In determining the burning characteristics of accelerators we usually try to note the first definite sign of vulcanization by a qualitative examination of the film.

By way of example, the tests on three accelerators are described: The amounts of accelerators employed are those which will give in the compound used a tensile 2,800 to 3,000 in 60 minutes in a mold cure at 40 pounds steam pressure. One-tenth part of tetramethylthiuram disulphide gives a distinct cure in 30 minutes at 212 degrees. One-half part of the condensation product of acetaldehyde and aniline, commonly known as ethylidene aniline, gives a definite cure in 30 minutes at 248 degrees. One-quarter part of the condensation product of heptaldehyde and aniline does not give any cure in 60 minutes at 248 degrees.

In other words this test shows that tetramethylthiuram disulphide burns rather badly; the condensation product of acetaldehyde and aniline resists burning quite well and the condensation product of heptaldehyde and aniline has even less tendency to burn, although it is a very powerful accelerator.

Actual milling experience in the factories gives the same results.

It should be pointed out that if alifatic amines are being tested care should be taken that the benzol contains no carbon disulphide. If carbon disulphide is present it combines with the amines to form dithiocarbamates which burn badly.

Aside from this precaution the method yields valuable results because accelerators are easily and accurately arranged in the order of their curing speeds at milling temperatures.

[1]Presented before the Rubber Division, American Chemical Society, New Haven, Connecticut, April 2-9, 1923.
[2]A contribution from the general laboratories of the United States Rubber Co., New York, N. Y.

Chemical Patents

The United States

RECLAIMING VULCANIZED RUBBER. The process of digesting vulcanized scrap rubber at an elevated temperature with approximately two to ten per cent of a volatile solvent obtained by distilling oil of turpentine with oxalic acid at an elevated temperature and removing the acid.—William B. Pratt, Wellesley Hills, assignor to E. H. Clapp Rubber Co., Boston, both in Massachusetts. United States patent No. 1,461,675.

The United Kingdom

VULCANIZING INDIA RUBBER. The reaction product of an open chain aldehyde having more than two and less than eight carbon atoms in the chain and ammonia is used as an accelerator in the vulcanization of rubber, etc. According to an example, 100 parts of rubber, 10 parts of zinc oxide, 3 parts of sulphur and 0.5 parts of the reaction product are mixed and vulcanized at 40 pounds steam pressure in 60 minutes.—Naugatuck Chemical Co., Naugatuck, Connecticut, assignee of S. M. Caldwell, Leonia, New Jersey. British patent No. 197,632.

MOLDED ARTICLES. Articles such as soles and heels for footwear are produced by adding to pulped cellulose fiber, such as wood pulp, a sizing and binding composition, and a precipitant, heating the mixture to about 180 degrees F. and molding in a heated mold provided with drain holes to remove excess moisture, the article being finally pressed in the mold. According to the provisional specification ten per cent of india rubber or the like or a solution of rubber in benzene may be incorporated with dry fiber, the mixture being molded under pressure and vulcanized by the Peachey process.—H. H. Hardy, 50, The Pryors, Hempstead, London, and L. McFarlane, Rosedene, The Avenue, Halton, near Leeds. British patent No. 197,980.

FRICTION LININGS. Compositions for the friction elements of brakes, clutches, friction gears, etc. Comprise woven or unwoven inorganic or organic fibers, or both, natural or artificial caoutchouc or like substances and finely divided volcanic or igneous metamorphic rock such as pumice or dolerite.—H. Frood and H. P. Alger, Sovereign Mills, Chapel-on-le-Frith, Derbyshire. British patent No. 197,991.

TREATING INDIA RUBBER. The resiliency of vulcanized rubber is restored, preserved or enhanced, or the plasticity of unvulcanized rubber is increased by treatment with acetylene. Perished vulcanized rubber is comminated and washed with water or caustic solution to remove impurities and swell the rubber, and is then placed in an atmosphere of acetylene for about two weeks, and is finally washed with hot water. The resulting powder is capable of revulcanization. The resiliency of rubber articles is restored or increased by the same treatment. Raw rubber is first treated to swell it and is then immersed in the acetylene. The acetylene is preferably generated by adding a solution of a carbohydrate to calcium carbide.—J. C. Koller, Hunter street, Bellevue, Johannesburg, South Africa. British patent No. 198,067.

The Dominion of Canada

SYNTHETIC RUBBER. Processes for the polymerization of butadiene hydro-carbons.—Herman Plauson, Hamburg, Germany. Canadian patents Nos. 232,641 and 232,642.

Germany

Patents Issued, with Dates of Issue

380,596 (July 23, 1921). Making artificial masses. Grigori Petroff, Moscow; represented by: P. Brögelmann, Berlin-Halensee.
380,774 (April 9, 1920). Vulcanizing rubber. Giuseppi Bruni, Milan, Italy; represented by: B. Wassermann, Berlin S. W. 68.
381,071 (December 15, 1920). Making soft, flexible artificial substances with dull, dry surface. Chemische Werke, vormals Auergesellschaft m. b. H., Kommanditgesellschaft, Berlin.

Italy

Patents Issued, with Dates of Issue

547-74 (November 14, 1922). Devulcanizing rubber and mixing it with new rubber and products resulting from this process. William Stocks, Miramar, Wellington, New Zealand.
547-113 (November 7, 1922). Making plastic masses similar to hard rubber. Paul Balke and Gustav Luysieffer, Troisdorf, Cologne, Germany.

MIRAC

A composite rubber softener under the trade name of Mirac has recently been perfected and introduced for rubber compounding. The following advantages are claimed for Mirac: it will neither retard nor accelerate the cure; can be used in all stocks and does not affect the color. It is usable with such organic accelerators as Hexa, D. P. G., ethylidine-aniline, etc., without interference with their action. It produces ideal adhesive stock for frictioning and smooth stock for tubing treads and other work. It will prevent blooming of raw stock, scorching on mill or calender, and in finished goods improves the aging quality.

RUBBER IMPROVES BUS SPRING SUSPENSION

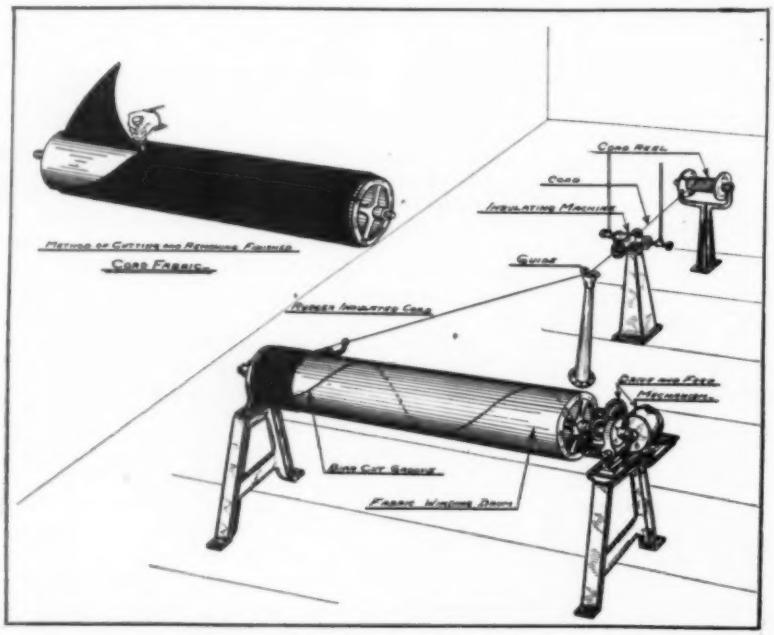
In a recent study of the fundamentals of bus design attention is called to the advantages of spring-end connections equipped with rubber springs. Where these are used silence, longer life and easier and cheaper renewal than shackles, superior ease of riding, absorption of the minor road vibration and greatly augmented tire mileage are among the benefits said to be secured.

The explanation of the improved service is to be found in the ability of large bodies of rubber, given space in which to flow, to absorb shocks and minute vibrations, its characteristic slowness in recovering from deformation thus imparting valuable damping effect on the springs.

Insulated Cord Fabric

THE decision of the U. S. Court of Appeals of the District of Columbia, Washington, in the case of Wayne v. Tew, will undoubtedly be of interest to the automobile tire industry, and particularly to tire manufacturers.

The issue in the appeal was whether priority of invention for a method of making rubberized cord tire fabrics should be awarded to Herbert N. Wayne of Santa Monica, California, or James D. Tew of Akron, Ohio. Wayne filed his patent application April 15, 1918, and the Tew application was filed July 25, 1918. The Examiner of Interferences found that Wayne had not exercised reasonable diligence in reducing his invention to practice, and awarded priority to Tew. The Examiners in Chief on appeal found that the senior inventor had been diligent in the matter and gave priority to Wayne. On appeal to the Commissioners the decision of the Examiners in Chief was reversed by the Assistant Commissioner, and from that decision the present appeal was taken by Wayne. On June 4, 1923, after four years of litigation, the Court of Appeals of the District of Columbia ruled that the decision of the Examiners in Chief was sound, and that the decision appealed from be reversed, thereby awarding priority of invention to Wayne.



The Wayne Insulated Cord Fabric Machine

The invention covers the rubberizing of the individual strands of cord by what Mr. Wayne terms "the insulating process," which is accomplished in an efficient manner by running the cord through a small tuber equipped with an insulating head—in precisely the same manner as ordinary telephone or electric light wire is covered with its insulating coating of rubber compound.

As the cord emerges from the die of the tuber and while it is still hot and plastic it is wound around a mandrel or drum, each strand being spirally laid in close contact with the last preceding layer or strand. When the mandrel or drum is thus covered with the uniformly and closely arranged rubberized cords the resultant sheet can be readily removed by severing the cords at an angle of 45 degrees to the line of their winding. It will thus be seen that a small mandrel may be used, preferably the correct diameter to produce one complete ply of cord fabric when removed from the mandrel, which will be ready for the tire builder without further cutting or preparation. When the rubberized cord is wound around a large drum and similarly cut from the drum at an angle of 45 degrees, a full table length of fabric may be produced which can then be cut into any width desired for various sizes of tires. In actual factory practice the former method, the small mandrel for producing individual plies, is claimed to have been satisfactory in quantity production.

This process of insulating cords by surrounding each strand of cord with plastic rubber, under the enormous pressure exerted around the die of a tube machine, insures not only uniformity of the rubber coating but real impregnation of the cord with rubber. By its use a better cushioning effect is insured between the individual strands, as well as between the assembled plies, and at the same time the possibility of cord or ply separation is effectively eliminated. On the point of economy it is claimed that with the costly operation of calenders for friction and skimming entirely done away with—not to mention the bias cutter and all incidental waste—the economy of producing and delivering a finished ply of fabric to the builder should be distinctly in favor of Wayne's process.

According to the testimony given during the trial of the case, one of the largest rubber companies of Akron was using this process in the production of cord tires. This would indicate that the insulating method is not only practical but must possess merit in the manufacture of cord tires.

The inventor claims that this type of fabric should be particularly adapted to the successful production of a strong, uniform and extremely resilient "balloon" or "doughnut tire"—the new type of casing which is being developed by the leading tire manufacturers.

LINCOLN HIGHWAY ASSOCIATION ELECTS OFFICIALS

At a recent meeting of the board of directors of the Lincoln Highway Association G. M. Stadelman, president of the Goodyear Tire & Rubber Co., Akron, Ohio, was elected one of the directors, while J. N. Gunn, former president of the United States Tire Co., was reelected president of the road-building organization.

The substantial sum of $100,000 represents the Goodyear contribution toward the highway project, and the company has not only been instrumental in the formation of the Lincoln association but has continued to be keenly interested in the subject of road construction.

RUBBER EXPORT PERCENTAGE REDUCED

The percentage of rubber permitted to be exported from Ceylon, Straits Settlements, and Malay States, at the minimum rate of duty for the quarter ending October 31, has been reduced from 65 per cent to 60 per cent, in accordance with the provisions of the rubber export restriction scheme at present in effect in these areas.

New Machines and Appliances

Hydraulic Pressure Alarm Gage

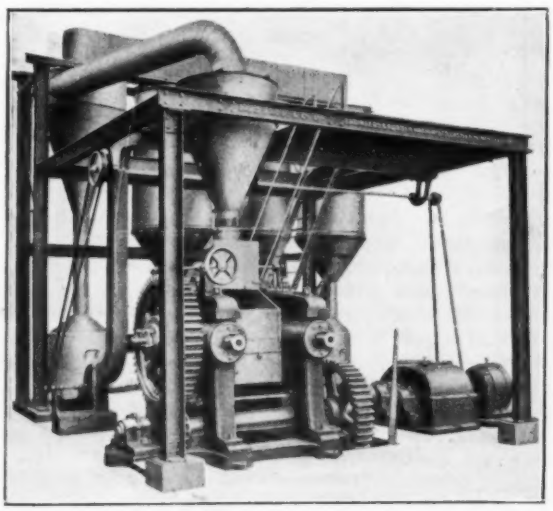
SERIOUS loss is possible in rubber mold work in the event of unexpected reduction of hydraulic pressure below the allowable minimum. To guard against such accidents the combination alarm pressure gage shown in the illustration was designed.

It comprises a noncorrodable gage movement with dial graduated to double the working pressure to give best results. The alarm attachment is intended for use with dry batteries and may be set to signal by ringing a bell when the pressure drops to a given point. — Utility Manufacturing Co., Cudahy, Wisconsin.

Utility Electric Alarm Gage

Hard Rubber Scrap Grinding Machine

The machinery assembly here shown constitutes a complete plant for grinding and grading scrap ebonite into hard rubber dust for use as a compounding ingredient. The apparatus comprises a double geared grinding mill operated in conjunction with a dust removal and separation system supported on an overhead steel frame work. This system includes an exhaust fan belted to the mill motor drive, a separator mounted over the grinding mill,



Bridge's Scrap Ebonite Grinding Apparatus

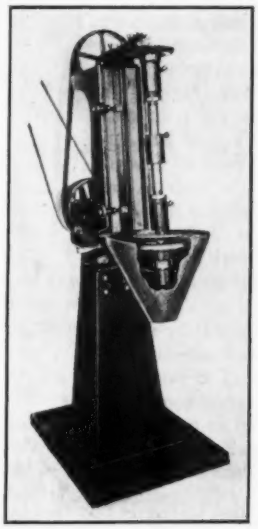
a dust grading separator, four dust collectors, canvas filters, and appliance for regulating the required grade of dust.

The ground ebonite falls into sheet steel hoppers under the rolls and is carried by suction through the fan upward into the separator over the mill. The heavier particles fall to the bottom of the separator and again pass through the grinding rolls while the light dust is discharged by the air exhaust into second and third separators where approximately 95 per cent of light dust will be deposited into the receiver located beneath. The air passes out at the top of the separator into a canvas bag filter which collects the remainder of the dust carried by the air. The plant is a very compact and economical unit, carefully planned, substantially constructed and efficient in operation.—David Bridge & Co., Ltd., Castleton, Manchester, England.

Rubber Stock Cutter

The machine here illustrated is a compact, belt-driven stock cutter, mounted on a pedestal and designed for cutting into pieces for molding any articles that can be run in quantity by a tubing machine, such as heels, bumpers, etc.

Tubed strips are cut to suitable lengths and placed vertically in the machine, where they descend through a guide and are cut at the bottom into pieces of regulated thickness by means of a circular knife. The cut pieces drop into the conical hopper for delivery to the curing presses. This machine effects a marked saving over the use of stamping machines or machines using dies on built-up sheet stock.—Donnelly Machine Co., Inc., Brockton, Massachusetts.



Don Lee Stock Cutter

Nett-Co Stirrers

The importance of proper agitation in the manufacture of rubber cements has not been fully realized until recently, and the subject merits a great deal more thought and attention on the part of cement manufacturers. By improved methods of agitation, operations can be speeded up, uniformity of product insured, and much valuable time and material saved.—New England Tank & Tower Co., Everett, Massachusetts.

Portable Cement Mixer

The hand-power churn or mixer here pictured is a very compact and portable arrangement for mixing such material as rubber cement. It is multiple geared to revolve all three paddles.

The method of mixing is a combination of agitation, elevation, and rapid rotation by the revolving beater blades and is particularly advantageous for keeping uniform compounded cements that are inclined to settle out.

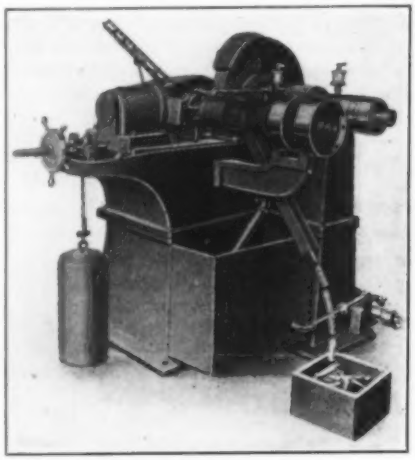
They are built in sizes from one to 500 gallons capacity for large plants. The mixer illustrated shows the hand stirring mechanism attached to a can with bale from which it is easily detachable

Hand Power Mixer

for cleaning or for use on a second container.—The Columbia Metal Products Co., Dayton, Ohio.

Hard Rubber Centerless Grinder

Volume production of hard rubber parts for fountain pens, pencils, and similar goods made from cylindrical rods and tubes requires the use of some means of true and rapid grinding. A machine for this purpose is shown herewith.



Sanford Cylindrical Grinder

The machine consists of a grinding wheel, run at regular grinding speed, opposed to a feed wheel running in the same direction but at a much slower speed and inclined at a variable angle to determine the rate at which the work is fed past the wheel. Between the grinding and the feed wheel are located ways for guiding the work along the cylindrical rest. Parts to be ground, not exceeding five inches in length, can be fed by gravity in a chute. Parts longer than five inches are fed individually.

The work rest is a cylindrical rod held in place in the work rest support. Its diameter is anything less than that of the work to be ground. The rest and its relation to the grinding and feed wheels is a distinctive feature of the grinder and is the basic reason for its ability to take heavy cuts and maintain accuracy.—F. C. Sanford Manufacturing Co., Bridgeport, Connecticut.

Tire Retreading Vulcanizer

The dry heat tire retread vulcanizer here pictured comprises a pot-like casting with contracted lower portion or boiler in which steam may be generated by means of a gas burner. The top of the boiler section has outlets for radially extending pipes connected with an annular mold section which forms half of a tire cavity. In this cavity is fitted a matrix section. The upper or movable mold section fits against the fixed matrix section.

Harris One-Operation Retreader

A reliner made of special heat-proof materials is inserted in the tire with any standard inner tube, mounted on a rim and placed in the mold. The upper half of the mold is lowered, clamped in place, and the tire is then inflated to its proper air capacity for curing. The steam circulates completely around the tire tread through the condenser shown at the left in the illustration. It is claimed that this vulcanizer will effect a cure in 45 minutes with 40 pounds of steam.

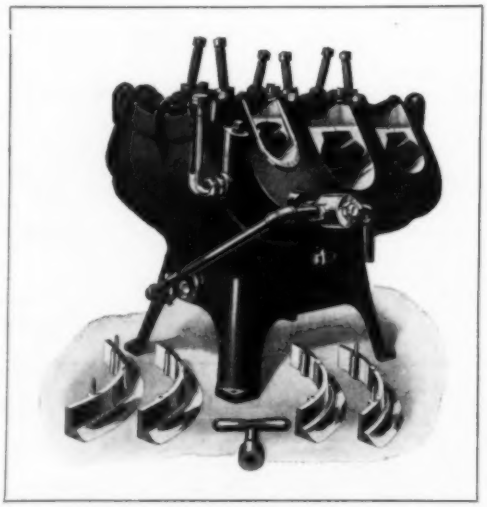
The molds are made in three sizes and accommodate every size of standard cord or fabric tire by means of removable reducing shells or matrix. The upper half of the mold is placed and removed with relation to the lower or fixed half by a differential chain block.

On each machine is a tube plate for vulcanizing tubes without additional heat or equipment. Uniform dry heat for this purpose is produced by the same heater used for retreading.—Harris Retreading Equipment Co., 1249 South Grand Avenue, Los Angeles, California.

Steamless Repair Vulcanizer

Retreading vulcanizers generally operate by steam heat but in the vulcanizer here represented the curing temperature is obtained from a non-freezing, non-evaporating heat retaining chemical called "Radifluid."

This material is said to eliminate the danger, difficulties and excessive operating cost of high pressure steam equipment for vulcanizing. It maintains the required heat with very little loss and expansion. Unlike water it can be brought to a high temperature with a small amount of applied heat. It does not form gas or disagreeable odors.



Model A Safety Vulcanizer

The body of the mold contains three vulcanizing sections provided with adjustable parts and clamps for holding the tires. The semi-solid "Radifluid" completely fills the body of the machine and derives its heat from a gas supply under thermostatic control. The chemical circulates freely in its cavity, which is made without internal supports or bridges.

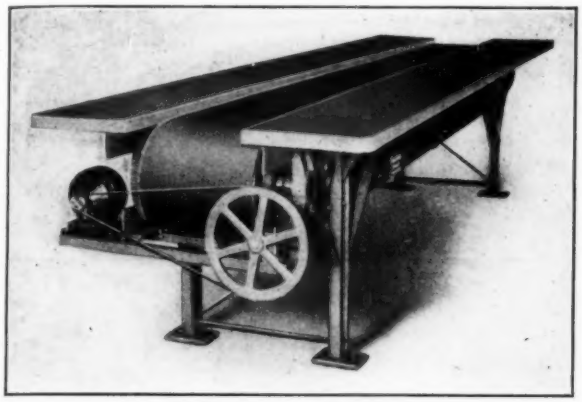
The apparatus is mounted on heavy supports and is very durable.—The Safety Vulcanizer Co., 1420 South Michigan avenue, Chicago, Illinois.

Belt Conveyors for Manufacturing Equipment

A motor driven belt conveyor mounted in a stand, as illustrated, has many applications in plants where small articles are handled in volume either in process of assembly, as in the case of rubber shoes, or for inspection and trimming, as in the case of heels, etc.

The working surface of the belt moves centrally between the

side woodwork of the bench top at any speed desired, thus carrying objects from one machine or operation to the next without



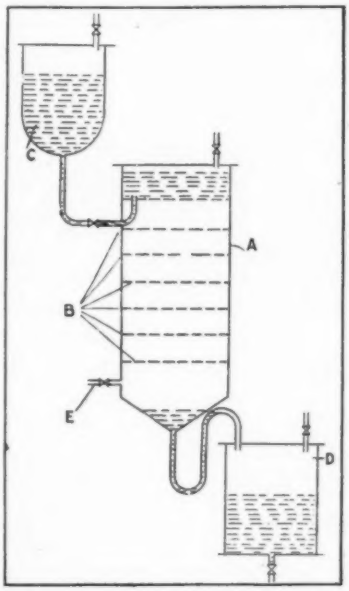
Footwear Assembly Conveyor

interruption, labor, congestion or confusion.—The Karl Kiefer Machine Co., Cincinnati, Ohio.

Machinery Patents

Peachey Solution Gas Impregnator

The Peachey process of vulcanization by absorbed gases has recently been further developed by the invention of two forms of apparatus designed to facilitate the impregnation of rubber solutions with the soluble gases.



Apparatus for Impregnating Liquids with Gases

The sulphur apparatus here illustrated comprises a closed chamber A provided with a series of superposed perforated trays B, and a supply container C for the liquid to be impregnated. The container C is connected to the chamber A by a pipe terminating above the uppermost tray. A collecting receptacle D is connected to the lower end of chamber A by a pipe so shaped as to form a liquid trap. Gas inlets E enter the lower section of chamber A, through which gases are admitted under regulation to replace that absorbed by the liquid.

The trays B are spaced apart and perforated, causing the liquid to pass from tray to tray in a series of fine streams which do not coalesce. By this means a very considerable area of the liquid streams descending in the vessel A is exposed to the ascending gas, and a relatively rapid absorption of the gas by the liquid takes place.

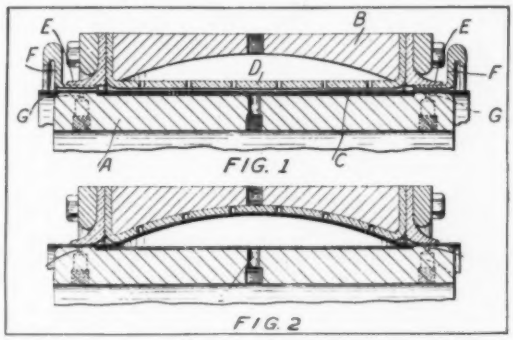
The trays may be removable and the gas or gases may be admitted to the vessel A at several points either below the lowermost tray or between trays.—A. Herring Shaw and Peachey Process Co., Ltd., British patent No. 197,368.

Making Flat-Built Tires

This invention covers the method and apparatus for making tires which are built up in the "flat" by superposed layers of cord fabric which are mechanically contracted to provide for subsequent stretching in the tire building process.

Figures 1 and 2 are transverse sections through half of the annular inner drum A and the outer drum B. The cylindrical face of the former is recessed to receive the gauze layer C, and stretched across the recessed face of the latter is a perforated rubber diaphragm D. Means are provided for creating a vacuum or partial vacuum in these recesses. Rubber jointing rings E, E, are clamped in place by side rings, F, F, that also hold the diaphragm in position. The fabric edges are held to the drum A by a vacuum or partial vacuum created through circumferential channels G, G.

A ply of cord fabric is placed around the inner drum which is slipped into the outer one, the guide rings temporarily pressing outward the jointing-ring lips which bear on the fabric edges



Sloper's Tire Process

after removal of the guide rings. This seal, however, does not prevent the edges from slipping inwards when the fabric is drawn by vacuum into the outer recess as shown in Figure 2.

Air is exhausted from channels G, G to hold the fabric, and admitted to the outer cavity, whereby the diaphragm D forces the fabric back, as shown in Fig. 1, thus mechanically contracting it. Vacuum is then applied to the recess occupied by the gauze C to hold the fabric to drum A which is then withdrawn from the outer drum B.

The second ply then applied to the drum is uncontracted and the process previously described is repeated with the two layers. A third uncontracted retaining ply is then placed over the two contracted plies, and this treatment is repeated for as many plies as may be required.

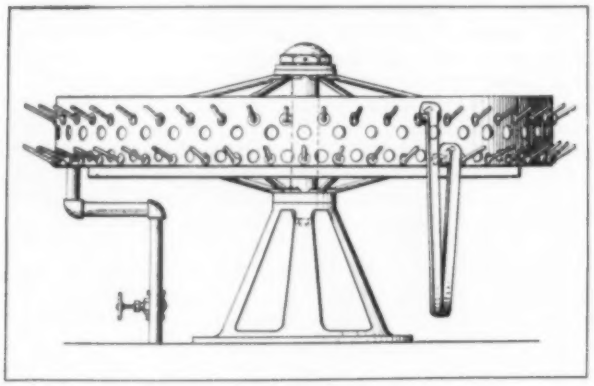
Thus, when the fabric is shaped in tire building, the outer uncontracted ply becomes the inner ply and the innermost ply becomes the outermost, the shaping process expanding the previously contracted plies all in correct proportion, and consequently all plies are under equal tension in the finished tire.—Thomas Sloper, Devizes, England. United States patent No. 1,458,732.

Machine for Making Splices in Inner Tubes

The machine herewith illustrated comprises a wheel and an endless drying rack conveying inner tubes in a circle while distributing heat for drying their cemented ends.

Workmen stationed at intervals around the revolving rack are thus able to perform the necessary successive operations of preparing and joining the tubes.

The apparatus is mounted on a pedestal and turned by motor. The wheel rim is chambered with perforated walls and is provided with a steam pipe from which heated air circulates through



Inner Tube Splicer

the perforations to dry the cement on the tube ends.—H. W. Smolk, Cleveland, Ohio. United States patent No. 1,450,235.

Other Machinery Patents

The United States

1,461,125 Fabric-stitching device. J. D. LaCroix, New Orleans, La., assignor to Kelly-Springfield Tire Co., Akron, Ohio.
1,462,197 Tire section cutter. E. O. Fellroth, assignor of one-third to F. N. Hegg and one-third to C. I. Lindskoog—all of Minneapolis, Minn.
1,462,198 Tire gage cutter. E. O. Fellroth, assignor of one-third to F. N. Hegg and one-third to C. I. Lindskoog—all of Minneapolis, Minn.
1,462,465 Tire machine. R. S. Trogner, assignor to The Goodyear Tire & Rubber Co.—all of Akron, Ohio.
1,462,478 Adjusting mechanism for trimmers. R. Beynon and J. C. Hintz, Chicago, Ill., assignor to Dryden Rubber Co., a corporation of Illinois.
1,462,524 Tire-stripping apparatus. W. C. Stevens, assignor to The Firestone Tire & Rubber Co.—all of Akron, Ohio.
1,462,586 Paper wrapping machine. E. C. Taylor, Longmeadow, Mass., assignor to The Fisk Rubber Co., Chicopee Falls, Mass.
1,462,712 Clamping bolt for tire molds. E. Lux, San Diego, Calif.
1,462,858 Apparatus for the production of weftless rubberized cord fabric. E. Hopkinson, New York, N. Y., and A. E. Jury, Rutherford, N. J.; said Jury assignor to Morgan & Wright, Detroit, Mich.
1,462,859 Stitching machine for joining rubber. T. B. Huestis, assignor to National India Rubber Co.—both of Bristol, R. I.

The Dominion of Canada

232,416 Method and apparatus for drying rubber. The Firestone Tire & Rubber Co., assignee of W. T. Runals, Jr.—both of Akron, Ohio.
232,517 Press vulcanizer. W. K. Fletcher and J. Rushmer, co-inventors, both of London, S. W. 18, England.
232,645 Apparatus for compressing carbon black. The Canadian Consolidated Rubber Co., Ltd., Montreal, Quebec, Canada, assignee of W. W. McMahan, New York, N. Y.
232,979 Apparatus for making hollow rubber articles. The Paramount Rubber Consolidated, Inc., Little Falls, assignee of F. T. Roberts, Upper Montclair—both of New Jersey.

The United Kingdom

197,053 Breaking device for mills. Dunlop Rubber Co., Ltd., Dunlop House 1, Albany St., Regent's Park, London, and J. Grant, Fort Dunlop, Erdington, Birmingham, England.
197,703 A tire-making machine. A. E. White, 88 Chancery Lane, London, England.
198,195 Machine for making bead cables for tires. A. G. Pratt, Deep River, Conn.

Germany

Design Patents Issued, with Dates of Issue

848,310 (February 15, 1923.) Cutting-machine. Hugo Löwenberg, Podbielskistrasse 310, Hannover.
849,291 (June 5, 1923). Apparatus for putting on rubber heels. Paul Franke, Nossen, i. Sa.
849,488 (June 13, 1922). Automatic impressing device for flexible materials. Continental Caoutchouc-und-Gutta-Percha Compagnie, Hannover.

Patents Issued, with Dates of Issue

380,608 (March 2, 1922). Apparatus for making stuffing-box packing. Rudolf Aldag, Nienburg.

Process Patents

Preparing Inner Tubes for Vulcanization

In ordinary practice inner tubes are made by wrapping plies of sheet rubber longitudinally around a mandrel, sealing the ends with adhesive tape, applying a straight wrapper, then a spiral cross wrapper, and finally vulcanizing.

The present invention consists in sealing but one end of the tube with adhesive tape, then applying a fabric cross wrapper, after which the tube is given a preliminary warming, of two minutes at 50 pounds in the heater, which causes the rubber to soften and flow, thus expelling all air at the joints and adjacent to the pole through the unsealed end of the tube.

The cross wrapping is then partially removed, and the second end of the tube sealed to the mandrel by a strip of adhesive tape. After the wrapping is entirely removed the tube is vulcanized.—Melvon A. Marquette, assignor to The Fisk Rubber Co., both of Chicopee Falls, Massachusetts, United States patent No. 1,457,986.

Rubber and Bakelite Cementing Process

Phenolic condensation cementing materials such as bakelite, etc., are advantageously used to stiffen, strengthen, and unite fabric or fibrous elements of shoes and other articles and then heat cured, preferably under pressure, which may also finish the article and render it waterproof. The union may be facilitated by interposing between the elements a fabric which has been previously frictioned or rubber coated on the side adjacent the vulcanizable rubber composition, while the other side has been previously coated or impregnated with phenolic condensation cementing materials.—Henry C. Egerton, Ridgewood, New Jersey. United States patent No. 1,457,826.

Other Process Patents

The United States

1,460,938 Method of mixing or masticating heavy plastic material. D. R. Bowen and C. F. Schnuck, assignors to Farrel Foundry & Machine Co.—all of Ansonia, Conn.
1,461,006 Method of making inner tubes. E. L. Fuller, assignor to The Goodyear Tire & Rubber Co.—both of Akron, Ohio.
1,461,531 Method of making cushion tires. F. R. Klaus and F. H. Meyer, Warren, Ohio.
1,461,984 Tire construction. F. B. Pfeiffer, Akron, Ohio.
1,462,452 Method of manufacturing pneumatic tires. K. B. Kilborn and W. S. Wolfe, assignors to The Goodyear Tire & Rubber Co.—all of Akron, Ohio.
1,462,563 Method of lubricating rubber molds. A. G. Voltz, Cleveland, Ohio.

The Dominion of Canada

232,720 Leather and rubber compound. M. Regula, New York, N. Y.
232,787 Process of making tire casings. E. Hopkinson and J. P. Coe, both of New York, N. Y., assignee of The Canadian Consolidated Rubber Co., Ltd., Montreal, Quebec, Canada.
232,821 Manufacture of goloshes. H. C. L. Dunker and L. G. A. Stibe, both of Helsingborg, Sweden.

Germany

Patents Issued, with Dates of Issue

380,512 (December 1, 1922). Method for automatically closing punctures in inner tubes. Marcel Charles Tournier, Paris; represented by: Dr. G. Winterfeld, Berlin S. W., 61.

Italy

Patents Issued, with Dates of Issue

548-69 (December 2, 1922). Improvements in the manufacture of vulcanized rubber. The Goodyear Tire & Rubber Co., Akron, Ohio.

DURING THE MONTH OF MAY QUEBEC AND ONTARIO IMPORTED from the United States miscellaneous rubber goods valued at $92,245, England's share of such commodities being estimated at $49,077, while the figure for Mexico is $17,584.

The Editor's Book Table

Book Reviews

"THE PREPARATION OF PLANTATION RUBBER." BY SIDNEY Morgan, A.R.C.S., Honorary Adviser to The Rubber Growers' Association in Malaya. Preface and chapter on Vulcanization by Henry P. Stevens, Ph.D., Consulting Chemist to The Rubber Growers' Association in London. Published by Constable & Co., Ltd., London, Bombay, Sidney. Cloth, 331 pages, with index, illustrated, 6 by 9 inches.

THIS new and revised edition of a standard work was considered advisable, the two earlier editions meeting with such success that copies were soon exhausted. The present volume has been entirely rewritten, and been brought up to date by the recording of the results of later researches and experience. Divided into six parts: Field Operations, Factory Operations, Machinery and Buildings, The Finished Rubber, General, and Vulcanization, the work contains much detailed information in the twenty-three chapters and there are many interesting illustrations. It is well indexed.

"METHODS OF MEASUREMENT OF PROPERTIES OF ELECTRICAL Insulating Materials—No. 471." By J. H. Dellinger and J. L. Preston, Bureau of Standards. Published by Government Printing Office, Washington, D. C. Paper, 72 pages, illustrated, 7 by 10 inches.

In this circular, one of a series of scientific papers prepared by the Bureau of Standards, the collaborating authors have indicated the reasons for selecting certain of the physical properties for measurement in a research on electrical insulating materials. The same considerations are said to apply in the measurement of many types of insulating materials besides the laminated phenolic materials. Comprehensive information is given in this bulletin regarding the measurement of various mechanical properties, such as density and moisture absorption, tensile strength, transverse strength, hardness, impact strength, machining qualities, etc.

"FACTS AFFECTING THE IMPORTATION OF RUBBER PRODUCTS into British Malaya, Panama, Newfoundland, Palestine and Syria." Four separate monographs prepared by the Rubber Division, Department of Commerce, P. L. Palmerton, chief. Published by Bureau of Foreign and Domestic Commerce, Washington, D C. Paper, 8 by 9 inches.

Many items of useful information are included in these publications, that relating to British Malaya being perhaps of greatest interest to the rubber industry. It is important to note that motor transportation is undergoing extensive development in British Malaya, while exports to that country of American tires and tubes have risen rapidly in quantity and value since the year 1913. In that year our total exports to Malaya of rubber goods were estimated at only $6,089, the value in 1922 being $263,675.

Recent Articles Relating to Rubber

Effect of Mould on a Sheet Rubber Compounded with Litharge. Acetic acid coagulated rubber cures faster than sodium-silico-fluoride prepared rubber. In the presence of litharge the reverse is true. The presence of mould had a tendency to slow the rate of cure of the acetic acid coagulated rubber when compounded with litharge.—H. P. Stevens. *Bulletin of the Rubber Growers' Association*, June, 1923, 341-342.

The Constitution of Rubber. M. C. Boswell, R. R. Parker and R. R. McLaughlin. *The India Rubber Journal*, 64, 981-5, 1922; *Transactions of the Royal Society of Canada*, 16, Section III, 27-47.

Adoption of Uniform Methods of Preparation and Valuation of Raw Commercial Rubbers. Discussion of feasibility and advantages of such procedure.—J. Audy. *Congrès* Production Coloniale Marseils, 1922, 157-63.

"Whole" Rubber or Desiccated Latex. A discussion of the relative merits of "slab" rubber and "whole" rubber by the Hopkinson process. *Malayan Agricultural Journal*, 10, 288-94, 1922.

Present State of the Rubber Manufacturing Industry and Its Problems. A lecture delivered before the London Section of The Institution of Rubber Industry, June 25, 1923. By Dr. W. G. Geer. *The India Rubber Journal*, July 7, 1923, 13-19.

Use of Rubber Latex in Making Paper. Brief discussion of the potentialities of rubber latex in the manufacture of paper, especially the elasticity conferred on the paper by the rubber.—Ismar Ginsberg. *Paper* 31, No. 24, 7-8, 1923.

Rubber Latex in Paper. Discussion and exceptions applying to the results of Shaw and Bicking (*Paper Trade Journal*, 75, No. 26) on the ground that they show conclusively that the latex used was deteriorated.—Frederick Kaye. *Paper Trade Journal*, 76, No. 9, 55, 1923; *Pulp Paper Magazine, Canada*, 21, 406, 1923.

Bulk Tests with Sodium Silico-fluoride as an Inhibitant of Mould Formation in Raw Rubber. The mould preventing powers of sodium silico-fluoride are confirmed.—H. P. Stevens. *Bulletin of the Rubber Growers' Association*, 5, 1923, 296-298.

The Action of Selenium Oxychloride on Pure Rubber. A study of the reactions between selenium oxychloride and the natural *Hevea* rubbers, pale crêpe, smoked sheet, Pará, and Caucho ball shows their physical properties are changed. The products are all amorphous powders without elasticity and swelling power, and insoluble in the ordinary solvents for rubber. Pure rubber hydrocarbon from natural Hevea rubbers shows a slightly different behavior in its reaction with selenium oxychloride, depending upon the source of the rubber and its method of coagulation. Judging by their respective behaviors toward selenium oxychloride, there is no difference between the pure hydrocarbon from the Hevea tree and the synthetic rubber made by polymerizing isoprene with metallic sodium.—Carl E. Frick. *The Journal of the American Chemical Society*, Vol. XLV, No. 7, July, 1923.

The Measurement of Temperature in Rubber and Insulating Materials. The thermocouple methods hitherto employed are shown to give temperature measurements in rubber articles, tires, etc., which are much too low, unless there is little or no temperature differential for several inches along the wires from the thermal junction. Curves are given whereby many recorded temperature measurements may be corrected. A new thermocouple casing is described which has been found convenient for measurement of temperatures in solid or pneumatic tires while they are in use on the road.—Ellwood B. Spear and J. F. Purdy. *Industrial and Engineering Chemistry*, August, 1923, 842-5.

Recent Important Investigations in the Chemistry of Rubber and Substantiation of the C_5H_8 Ratio.—Harry L. Fisher. *Industrial and Engineering Chemistry*, August, 1923, 860-2.

New Applications of Phenol Resins in the Chemical and Allied Industries.— L. V. Redman. *Industrial and Engineering Chemistry*. July, 1923. 677.

Hydrogenation of Caoutchouc.—C. Harries, Berichter der Deutschen Chemischen Gesellschaft. 1923, 56, 1048-51.

Rubber from Sprayed Latex. Rubber prepared by the Hopkinson method of desiccating latex by spraying vulcanizes more rapidly than ordinary rubber and the vulcanized product possesses somewhat higher tensile strength.—H. P. Stevens. *Bulletin of the Rubber Growers' Association*, 1923, 5, 224-5.

The Vulcanization of Rubber—III. The third Cantor Lecture delivered before the Royal Society of Arts.—Henry P. Stevens. *The India Rubber Journal, London*, Vol. 66, No. 5. 1923, p. 13.

Vulcanizing Properties of Rubber from Preserved Latex. Although the efficiency of litharge as an accelerator is largely dependent on the presence of non-caoutchouc constituents in the

rubber, the additional non-caoutchouc material in "sprayed" rubber does not influence the activity of the litharge towards vulcanization.—H. P. Stevens. *Bulletin of the Rubber Growers' Association.* 1923, 5, 225-6.

Rubber Pigments. Paper read before the Institution of Rubber Industry, London Section, April 9.—D. T. Twiss.

The Microscope Helps Rubber Development. Paper read before the Royal Microscopical Society, London, May 16, 1923.—W. M. Ames.

Development and Increased Production in the Manufacture of Hose. (German).—G. Nowak, *Gummi-Zeitung,* Berlin, July 6, 1923, 643-645. Illustration, diagrams.

Some Considerations on Bud-Grafting. (Dutch).—Dr. A. Steinmann, *Nederlandsch-Indisch Rubber-en-Thee Tijdschrift,* Soekaboemi, Java, July 1, 1923, 253-258. Tables.

New Trade Publications

AN ATTRACTIVE CATALOG, PROFUSELY ILLUSTRATED WITH PHOTOgraphs representing the company's installations of special machinery, has been recently issued by the Southwark Foundry & Machine Co., Philadelphia, Pennsylvania. Among the various industrial establishments shown in this "Album of Engineering Achievement" are a number of well-known rubber organizations, while the equipment includes hydraulic heater presses for rubber tires; steam platen presses; hydraulic machinery for rubber vulcanizing and molding; vacuum and hydraulic pumps, etc.

SPECIAL CIRCULARS ISSUED BY DEPARTMENT OF COMMERCE

Trade items of interest in connection with foreign countries are now being issued by the Bureau of Foreign and Domestic Commerce, Washington, D. C., in the form of special circulars, space not permitting the insertion of such items in *Commerce Reports.* Among these new publications are included: a bulletin entitled "Austrian Trade in Rubber Products"; Special Circular No. 216, "Marking of Imported Tires in Spain"; and Special Circular No. 222, "Canadian Rubber Goods Trade in Fiscal Year Ended March 31, 1923."

SCHRADER CABINET FOR TIRE VALVE ACCESSORIES

A display cabinet, twenty inches in height and a replica of the well-known Schrader tire pressure gage, is being sent by A. Schrader's Son, Inc., Brooklyn, New York, to various dealers in the company's products. At the rear of the cabinet is a door which can be locked, while inside are eight compartments planned to hold Schrader tire pressure gages, valve and dust caps, valve repair tools, a wrench and pump connections. This "Silent Salesman" attracts considerable attention in automobile accessory supply houses, and holds Schrader merchandise compactly.

Front **Back**
Schrader's Silent Salesman

GERMAN CONTINENTAL TIRE IN DUTCH WEST INDIES

The German Continental and five American-made tires are sold in Curacao. The Continental is not offering much competition at present, according to Consul B. S. Rairden.

The Obituary Record

Prominent Textile Manufacturer

Pope F. Callaway, for 20 years identified with the textile industry in Georgia, died recently at La Grange following a brief illness. Mr. Callaway was a brother of Fuller E. Callaway and a director in several mills and other corporations controlled by the Callaway organization.

He was also manager for some years of the Fuller E. Callaway Co., a wholesale dry goods company of La Grange. Funeral services were held at the residence of Fuller E. Callaway in La Grange.

Thermoid Representative at Pittsburgh

Following a lengthy illness, William Yardley Cadwalader, of Pittsburgh, Pennsylvania, representative of the Thermoid Rubber Co., of Trenton, New Jersey, died at the former place on August 14. He had been connected with the Thermoid company for the past twenty years and during that time had been at the Pittsburgh office. Mr. Cadwalader was born at Yardley, Pennsylvania, where the interment took place.

TIRE MANUFACTURERS NOT GUILTY OF PROFITEERING

The farmer's discontent with existing political and trade conditions does not extend to the tire industry, for he realizes that he can buy tires at reasonable prices. The fact is that the tire industry has not been guilty of profiteering. After the slump of 1920 it pocketed its losses and made substantial price reductions, with the result that business came back more quickly than in almost any other line. When commodity prices began rising many months ago, it resisted the temptation to make the purchaser bear all the burden and was content with a smaller margin per unit, realizing that it would be made up in volume.

The tire industry, which suffered severely in the depression of 1920, owed its so-called "dramatic" recovery to its determination to charge for its products prices that were fair and reasonable. The automobilist must have tires, and tire makers, therefore, could easily have made their prices higher and got away with it after the stocks they had on hand in the middle of 1920 had been liquidated—but they didn't do it. They probably gained a greater volume of business by this procedure but they might have made larger profits had they made increases, because most of this profit comes from replacement rather than original equipment business and the owners of cars in use would have bought tires no matter what they cost.

There was no increase in tire prices until the beginning of 1923, although raw rubber and cotton prices began to advance rapidly in the summer of 1922. This meant that manufacturers were giving the public the benefit of raw material purchased at a lower price. This was done in the face of heavy losses suffered only a short time before when material prices fell precipitously after the manufacturers had made commitments for huge stocks bought at the peak. Relatively small increases were made early this year when stocks of low priced materials were depleted. Later on, as the raw material markets rose still higher, another small increase became necessary. Soon thereafter material prices eased off and prices to the consumer were lowered, notwithstanding the fact that the manufacturers had on hand considerable quantities of higher priced rubber and cotton purchased late in 1922 and in the early months of 1923.

Certain undoubted evils in the tire industry are being uncovered but statistics prove that, while prices for many other commodities began rising many months ago, there has been no profiteering and exploitation of the public among legitimate tire manufacturers. These facts should carry much weight in any discussion of the tire industry.—*Automotive Industries.*

New Goods and Specialties

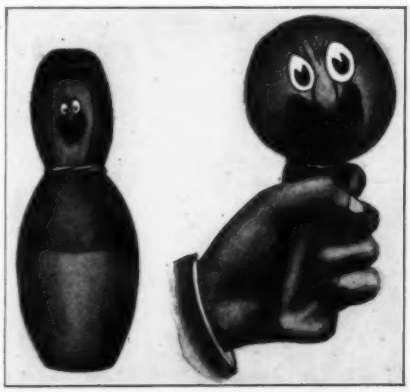
A Combination Bicycle, Tricycle and Wagon

ANY dealer in toys will concede that the Crimson Flyer illustrated has unusually fine selling features for the holiday trade. It is equally adaptable for boys and for girls, is adjustable to fit children from 5 to 12 years of age, is bright red in color and has a bright blue seat shaped in front like a bicycle seat but extending back in a square slab large enough to accommodate a passenger or to hold school books or bundles. A wagon-like box is arranged beneath the seat which is especially for packages, a convenience which will be appreciated by the boy on errands or the little girl with her dolls. It is geared two to one for speed, one revolution of the crank sending it 8 feet. Gear and shaft are enclosed to avoid accidents. The 3 wheels, arranged tricycle fashion, are 16 inches in diameter and are fitted with best grade rubber tires. The pedal treads are also of rubber.—The Sterling Machine & Stamping Co., Wellington, Ohio.

The Crimson Flyer

A Vocal Caricature Doll

The "Wonder Doll" illustrated has a hand-painted face which may be made to represent any comic or public character, and a double tone to its voice which if the bodies of two of them are squeezed at the same time makes a noise which will be the delight of any youngster. One with imagination can make the dolls carry on amusing conversations. At the same time the head swells and the expression of the face changes comically under the pressure. The valve with which the doll is provided cannot go wrong, the manufacturers say, and if the dolls should eventually flatten they can be inflated again with an ordinary bicycle pump. The best quality of rubber is employed in the manufacture.—H. Lauritzen, wholesale agent and exporter, Charterhouse, Chambers, Charterhouse Square, London E. C. 1, England.



The "Wonder Doll"

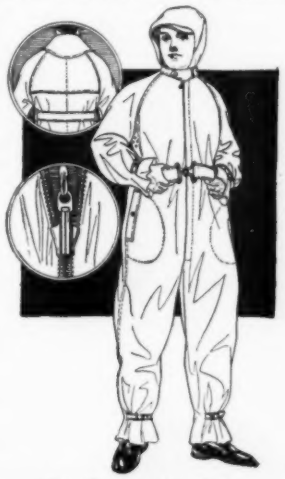
THE PIONEER TOY & NOVELTY CO., PITTSBURGH, PENNSYLVANIA, includes in its specialties this season a toy washing machine which when wound up washes "just like mother's." It is made of copper-finished zinc and aluminum, has a glass top and tank, and is operated by a spring motor. A real wringer with two rollers of solid rubber is supplied with each machine.

Gloves Made from Plantation Rubber

A recent invention reduces the making of rubber gloves to simply folding a sheet of plantation rubber over on itself or laying two sheets together and cutting out the gloves to the shape of the hand. The pressure exerted on the edges during the cutting tends to make them stick together, and after the cutting the gloves are submitted to the "Peachey" process of cold vulcanization, or any other suitable process. Various forms of the raw plantation or crêpe rubber may be used, and the gloves may be made entirely impervious to moisture or with perforations, according to the use to which they are to be put.—G. F. Underwood, 5 Fenchurch street, London, E. C., William Luffsmith, 63 Old Steine, Brighton, and the Plantation Rubber Manufacturing Co., 14 Mincing Lane, London, E. C., England.

Combination Waterproof Suit and Cap

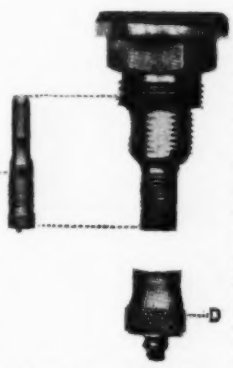
The three views of the Rubber-All suit shown in the accompanying picture give in detail its special features. It is made of double texture cloth with a sheet of pure rubber between the layers, and the closing is made by means of the rust-proof hookless "tobacco pouch" fastener, which opens or fastens the suit in a jiffy by a pull on the slider. The hood when not in use is turned down to form the collar of the suit, and a cape-yoke provides for ventilation. A snug fit around wrists and ankles is the final touch which insures dry comfort in all sorts of weather while fishing, yachting, hunting, motor-cycling, changing tires, etc.—The Rubber-All Co., 821-823 Broadway, New York, N. Y.



The Rubber-All Suit

A New Michelin Tire Valve

A new type of tire valve which is being marketed by the Michelin organization in other countries but not in the United States has as a special feature a metal joint superseding the old type inside rubber washer, the advantages claimed being that it will last practically forever and there are no leaks through perforated joints or through parts becoming unscrewed, the joint and the valve being in one piece. The joint of the valve cap D is housed in a metal casing to prevent undue friction of the washer when the cap is screwed on. The plug, which is contained in the piece B, is pushed and kept clear of its seating when the cap D is screwed on, thus obviating the necessity for "unsticking" it before inflation. The Schrader gage may be used on the new valve.—Michelin Tyre Co., Ltd., London, England.



New Type Michelin Valve

All-Rubber Blind Cord End, Pull Handle, and Non-Slip Bath Mat

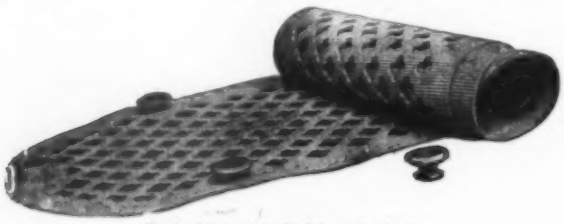
Blind Cord End

The blind cord end illustrated is molded in one solid piece of rubber in white, green, blue, or red, and is furnished to the trade carded in lots of two dozen assorted.

The lavatory pull handle is also molded in one piece, and the colors are white, drab, and red. The resilient rubber prevents the handle from chipping and disfiguring the wall. It is furnished complete with chain and fittings, in dozen boxes. The American-made article of this type is usually of wood with a rubber strip encircling its widest part as a buffer.

Lavatory Pull Handle

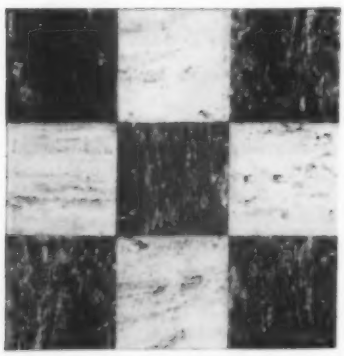
The rubber bath mat illustrated, besides being so constructed that it will lie flat and afford a good foot-hold, is provided with a number of rubber suckers which hold it in place and prevent it from slipping even under pressure. The mat is made 43 by 15 by 3/32 inches complete.—Reliance Rubber Co., Limited, London, England.



Bath Mat with Rubber Suckers

"Niagara" Rubber Flooring

Rubber tiling, which has proved to be a most satisfactory floor covering in a number of our largest buildings, both as to appearance and durability, is now made in a variety of attractive colors and designs, in interlocking and square blocks of 3/8, 1/4, 3/16, and 1/8-inch thickness in plain colors and mottled effects, and in 6 by 12-inch squares representing marble, as well as in inlaid sheets in all colors, with line borders as a finish for mats and matting.—Buffalo Weaving & Belting Co., 229 West Lake street, Chicago, Illinois.

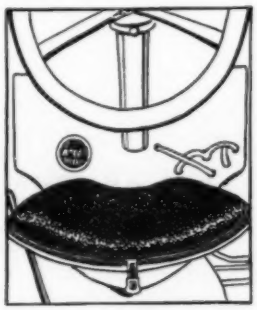


"Niagara" Mottled Rubber Tiling

THE UNITED STATES TIRE CO., 1790 BROADWAY, NEW YORK, N. Y., has added a new cushion tire to its truck line. The sizes are: 32 by 4, 34 by 4, 36 by 4, 34 by 5, 36 by 5, 34 by 6, 36 by 6, and 36 by 7. It is intended for use on 1½, 2, and 2½-ton trucks and buses where speed and traction do not require pneumatics, and on front wheels of larger vehicles.

Comfy Cushion for Tractor Seat

A shaped cushion covered with rubber cloth and filled with resilient material, is designed to resist hard wear as well as to insure the comfort of the tractor driver. It is water and weather-proof and is provided with heavy web straps for attachment.—Atlas Specialty Manufacturing Co., Chicago, Ill.



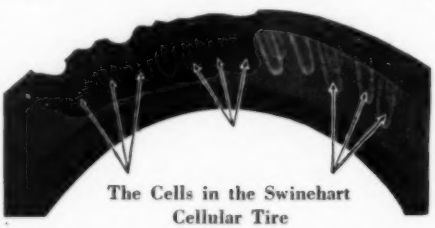
Tractor Comfy Cushion

A Non-Stretching Tire Patch

The Locktite tire patch has a canvasback reinforcement which prevents the patch from stretching and makes the weak spot in the tube or casing actually the strongest after mending, according to the manufacturers, and the repair is permanent. The repair material is furnished in an attractive all-metal package and the garage size contains sufficient for about 300 repairs, making possible a profit of 1,000 per cent on the outfit.—Locktite Patch Co., Detroit, Michigan.

A Rubber Tire That Breathes

The accompanying illustration shows the special feature of the Swinehart cellular tire—the cells through which the tire actually breathes, being filled with air and emptied automatically as the tire revolves. This breathing action keeps the rubber cool and prevents it from deteriorating from excessive heat. The tire is semi-pneumatic and is said to have remarkable resiliency due to the construction of the cells, and to have longer life, greater mileage, lower operating costs and fewer calls for repairs than the ordinary tire.—The Swinehart Tire & Rubber Co., Akron, Ohio.



The Cells in the Swinehart Cellular Tire

"Vitallic" Cord Tires and Tubes

"Vitallic" Tread Designs

Two new tread designs are shown in the accompanying illustration of "Vitallic" cords, which are described by the manufacturers as having unsurpassed endurance because the tread, sidewalls, cushion, bead, cord, and breaker are welded together with a friction which admits of no separation and affords the limit of resistance to wear. The tubes are made of pure gum floating stock, of laminated construction, and are guaranteed to be free from imperfections in material and workmanship. — Continental Rubber Works, Erie, Pennsylvania.

Ribbed Surface Radion Dial

One of the latest innovations in the radio field is a new radion dial with a ribbed surface which enables tuning not only with the hand on the knob but with the tips of the fingers as well. It is possible with this dial to tune almost as fine as with a vernier, for the ribbed surface gives a knob almost as large as the face of the dial itself.

Ribbed Face Radion Dial

This dial is manufactured in 3-inch and 4-inch diameters. Both sizes are graduated from 0 to 100 over 180 degrees of the circumference, with graduations reading clockwise. A strong metal insert is molded in the center, allowing 3½ full turns of the set siren through the metal. A reducing sleeve permits the use of the dial for either a ¼-inch or 3/16-inch shaft hole.—The American Hard Rubber Co., 11 Mercer street, New York, N. Y.

Official Weight Sponge Rubber Baseball

One of the most popular sporting goods items of the season is the sponge rubber baseball illustrated. It is of regulation size and weight and is of sponge rubber all the way through, with no

Faultless No. 100 Sponge Rubber Baseball

hollow or filled center, so that it cannot deflate and will retain its shape and bounce indefinitely. It makes a particularly satisfactory catch ball, also, on account of its "feel."—The Faultless Rubber Co., Ashland, Ohio.

A New Type of Tap and Hose Union

The Mersey Lock Co. is marketing a new type of fitting for a tap and hose union. A specially shaped rubber washer is employed which necessitates machining on the inside the top casting for the bib of the cock; the hose pipe sleeve is also machined to fit the under side of the washer. A slight turn given to the nozzle after the fitting is slipped on the tap tends to "crowd" the rubber and tighten it on the bib. A small screw adjusts the sleeve.—The Mersey Lock Co., Toronto Works, Riverview Road, Wallasey, Cheshire, England.

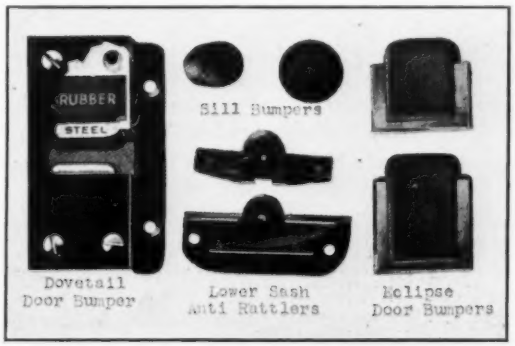
Door Bumpers and Anti-Rattlers

Very special prices are quoted on quantity orders of the door bumpers and anti-rattlers illustrated. The dovetail door bumper is designed for use on heavy cars and serves as an anti-rattler as well as a bumper, absorbing all the up-and-down motion of the door and eliminating sideplay. It has a die-cast casing into which the rubber bumper, protected by steel bumper shoes, fits. The wedge plate is of bronze.

The two sill bumpers are usually sold together, one being positioned at the top of the door frame and the other fitted into the sill opening, the sill plate being perforated to allow for the projection of the rubber knob.

In the lower-sash anti-rattlers the circular rubber cushion is held tight against the glass, the larger design having double spring pressure for the purpose.

The Eclipse door bumper, of which two sizes are shown, has a steel stamped base, parkerized to prevent rusting, and the rubber

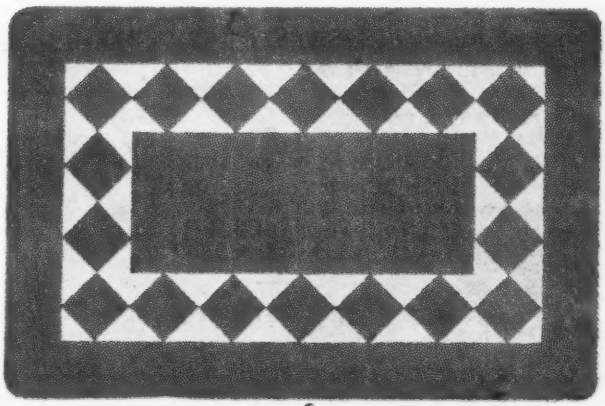


Ternstedt Rattle Eliminators

is grooved at the sides to fit the corresponding ribs of the casing. Only one flat-head wood screw is necessary to make the installation.—Ternstedt Manufacturing Co., Detroit, Michigan.

Crêpe Rubber Bathroom Rug

Rubber rugs for the bathroom are increasing in number and designs. The one illustrated was made in Ceylon and is 2 by 3 feet in size. The advantages claimed for the rubber rugs are that they lie perfectly flat and do not curl up at the corners nor skid on tile floors and they can be mopped at the same time that the floor is washed, without extra effort. The colors are fast



Rubber Rug for the Bathroom

and the combinations of colors are bright and attractive.—Darragh, Smail & Co., Ltd., Importers & Manufacturers, 177 Water street, New York, N. Y.

News of the American Rubber Trade

Financial

Dividends Declared

Company	Stock	Rate	Payable	Stock of Record
Boston Woven Hose & Rubber Co..	Com.	$1.00	Sept. 15	Sept. 1
Goodrich, The B. F., Co.....	Pfd.	1.75q.	Oct. 1	Sept. 21
Hood Rubber Products Co.....	Pfd.	1¾% q.	Sept. 1	Aug. 25
Lee Rubber & Tire Corp.....	....	50 cts. q.	Sept. 1	Aug. 15
Miller Rubber Co.....	....	2% q.	Sept. 1	Aug. 15
Miller Rubber Co.....	....	1% acc.	Sept. 1	Aug. 15

New York Stock Exchange Quotations

August 25, 1923

	High	Low	Last
Ajax Rubber, com.....	6⅛	6⅛	6⅛
Fisk Rubber, com.....	7¼	7¼	7¼
Goodrich, B. F., Co., com.....	23½	23½	23½
Kelly-Springfield Tire, com.....	31¼	31	31¼
Keystone Tire & Rubber, com.....	4½	4½	4⅜
United States Rubber, com.....	40	39⅛	40

Akron Rubber Stock Quotations

Quotations of August 25 supplied by App-Hillman Co., Akron, Ohio, were as follows:

	Last Sale	Bid	Asked
American com.	7¾	...	10
American pfd.	50	...	40
Amazon com.	2	3	...
Firestone com.	64	65	...
Firestone 6% pfd.	92	90	93
Firestone 7% pfd.	83	83½	90
General com.	170	150	157
General 7% pfd.	94½	94	98
Goodrich 6½'s	99½	99½	100
Goodyear com.	10⅛	10	10¼
Goodyear pfd.	46⅛	45	47
Goodyear 1st mtg. 8's	116½	116	117
Goodyear deb. 8's	102¼	101½	102½
India com.	80	78	82
India 7% pfd.	90	78	85
Mason com.	1½	1¼	2
Mason pfd.	16	14	18
Marathon	2	...	2
Miller com.	66½	...	66½
Miller 8% pfd.	96½	96½	97½
Mohawk com.	10	...	8
Mohawk pfd.	49½	51	...
Rubber Products	20	10	20
Seiberling com.	3¼	3½	4
Seiberling pfd.	50	...	50
Star com.	20	20	25
Star 8% pfd.	80	...	80

The Fisk Rubber Co.

The Fisk Rubber Co., Chicopee Falls, Massachusetts, has reported for the six months ended June 30, 1923, gross sales, less returns and allowances, of $29,167,650. Net operating profit, after interest and financing charges, is estimated at $2,204,209. From this amount the company appropriates $500,000, additional reserve for contingencies, and carries to surplus $1,704,209.

The company's balance sheet as of June 30 showed total assets of $53,919,128, included in which were capital assets of $17,752,314, after deduction of $5,246,820 for depreciation. Current assets totaled $30,649,565, while current liabilities are estimated at $10,521,992. Reserves total $1,442,916, while the surplus stands at $5,232,702

The B. F. Goodrich Co.

The B. F. Goodrich Co., New York, N. Y., for the six months ended June 30, 1923, reports net sales of $54,074,925, and net earnings after depreciation, interest and all charges, but before Federal taxes, of $3,006,384, which was carried to surplus and available for dividends.

The balance sheet as of June 30, 1923, shows net current assets of $53,047,211 and net current liabilities of $16,833,544 The current assets included inventories valued at $30,326,131; accounts and notes receivable, $18,974,194; Liberty bonds, $15,127; and cash, $3,731,757. The current liabilities included notes payable, $13,073,356; accounts payable, $3,223,882; and sundry accrued liabilities, $536,305. The profit and loss surplus on June 30, 1923, was $12,699,360.

The United States Rubber Co.

United States Rubber Co.'s sales for the first six months of 1923 amounted to $87,710,205, an increase of $13,776,434 over the corresponding period of last year. All of this increase was in sales of commodities other than tires. Excluding tires, which at prevailing selling prices constituted substantially less than one-third of the total sales, the increase in dollar volume of sales was approximately 28 per cent. The company has more than maintained its position in the tire trade, but the results have been unsatisfactory due to general conditions in the industry.

Net income before interest amounted to $7,743,346; interest on the funded debt amounted to $2,386,803, and all other interest amounted to $783,682, making a total of $3,170,485, thus leaving net profits of $4,572,861 for the first six months, after interest and all other charges, including depreciation of plants. This compares with $3,052,918 for the first six months of 1922, an increase of $1,519,943.

The consolidated surplus as of June 30, 1923, after providing for the dividend on the preferred stock payable July 31, 1923, amounted to $33,894,867.

As of June 30, 1923, current assets amounted to $138,420,000, consisting of $54,193,000 in cash and accounts receivable, and $84,227,000 in inventories of finished goods and raw materials, and current liabilities amounted to $58,550,000, consisting of $38,425,000 in bank loans and $20,125,000 in current accounts payable, including acceptances for importation of crude rubber, and accrued liabilities.

Contractual liabilities representing commitments for purchase of raw materials and supplies covered only current requirements, and as to prices were at or below current market.

Through the operation of sinking funds the company has retired, since December 31, 1922, $772,000 of its first and refunding mortgage 5 per cent gold bonds and $184,000 of its 7½ per cent gold notes, thus making a reduction of $956,000 in the funded debt.

The company's current liabilities are created only for current operating requirements, and are wholly represented by accounts receivable and inventories. The accounts receivable are collectable, adequate reserves having been established out of current income to provide for possible bad debts, and inventories are at sound values and as to quantities are conservative on the basis of current requirements.

The Goodyear Tire & Rubber Co.

The Goodyear Tire & Rubber Co., of Akron, Ohio, for the six months ended June 30, 1923, reports net sales, exclusive of subsidiary companies, of $55,439,631, and net earnings after taxes and depreciation of $8,967,079. After deducting interest and all other charges, and adding the operating profits of the California company, amounting to $620,392, a balance of $6,314,318 was carried to surplus and available for dividends.

The balance sheet as of June 30, 1923, shows net current assets of $59,722,785 and net current liabilities of $7,873,657. The current assets included inventories valued at $37,003,779, carried at cost or market, whichever is lower, accounts and notes receivable, $11,825,571; treasury certificates and other securities, $2,193,719;

and cash, $8,699,715. The current liabilities included accounts payable totaling $4,930,696; acceptances, $1,299,709; accrued interest, $1,243,251; and accrued dividends, $400,000. The profit and loss surplus on June 30, 1923, was $12,193,209.

Production and sales during the first half of 1923 were substantially greater than those of the same period last year, but general trade recession and lower volume was felt in the second quarter. July sales improved and indicate a better volume through the third quarter.

New Incorporations

American Wringer Co., May 15 (Rhode Island), $400,000. C. N. Cook; E. H. Rathbun; R. J. B. Sullivan; S. Ballou; H. Salomon. Principal office, Woonsocket, Rhode Island. To manufacture clothes wringers and rubber rolls for every purpose.

Armstrong Rubber Company of Illinois, June 8 (Illinois), $5,000. G. F. Armstrong, president and treasurer; F. A. Winship, secretary. Principal office, 1223 South Wabash avenue, Chicago, Illinois. To sell tires and tubes manufactured by the Armstrong Rubber Company of New Jersey.

Athol Manufacturing Co., June 30 (Massachusetts), $600,000. W. G. Nims, president; A. H. Starrett, vice president; S. A. Reed, treasurer and general manager. To manufacture Pyroxylin coated material.

Bowler Tire Co., Inc., August 17 (New York), $5,000. A. M. and H. D. Bowler, both of Amsterdam, New York; M. Van Keuren, Albany, New York. Principal office, Amsterdam, New York. To manufacture tires for vehicles.

Brunswick Tire Corporation, The, August 18 (New York), $100,000. B. E. Bensinger; H. F. Davenport, both of 623 South Wabash avenue, Chicago, Illinois; C. P. Miller, 29 West 32nd street, New York City. To manufacture rubber and rubber goods, tires, etc.

Central Tire & Garage Co., June 29 (Oklahoma), $10,000. H. D. Culler; C. B. Cooke; L. M. Cullers, all of Oklahoma City, Oklahoma. Principal office, Oklahoma City, Oklahoma. To deal in tires and accessories.

Comins Rubber Shoe Co., June 28 (Massachusetts), $10,000. A. C. Lurie, president, 65 Westminster street, Roxbury; T. C. Cribben, treasurer, 18 Magnolia Square, Dorchester; H. A. Mintz, 105 Winchester street, Brookline; H. M. Comins, 26 Mallon Road, Dorchester, all of Massachusetts. Principal office, Boston, Massachusetts. To manufacture, buy, sell and deal in men's, women's and children's rubber footwear.

Convenient Tire Shops, Inc., The, August 7 (New York), $25,000. W. N. MacDonald, 415 Raines Park; A. M. Johnson, 120 Richland street, both of Rochester, New York; J. J. Brennan, 202 Paul avenue, Syracuse, New York. Principal office, Syracuse, New York. To sell mechanical rubber goods, tires, etc.

Cor-Lock Tube Co., The, July 21 (Ohio), $50,000. J. E. and J. R. Stewart; H. C. Bender; F. M. Meagher; C. L. Deerker. Principal office, Washington, C. H., Ohio. To manufacture rubber goods.

Crescent Garter Co., July 2 (New York), $100,000. L. and R. Reibstein; I. Itkowitz. Principal office, 515-517 Broadway, New York City. To manufacture, buy, sell, import and export garters, armbands, hose supporters and other elastic web specialties.

Dreher Sales, Inc., July 30 (New York), $10,000. H. W. Paprocki; F. H. Butchorn; H. B. Holland, all of 37 Wall street, New York City. Principal office, Buffalo, New York. To manufacture tires and tubes.

Genesee Rubber Corporation, August 9 (New York), 250 shares preferred stock $100 and 750 shares common stock. B. E. Shove; A. Lundberg; H. W. Clasen, all of Syracuse, New York. Principal office, Rochester, New York. To deal in rubber tires and maintain garages.

Goble Rubber Process Co., The, July 25 (Ohio), $10,000. J. S. Zimmerman; H. L. Smith; M. L. Merchant; G. E. Goble; F. G. Carpenter. Principal office, Cleveland, Ohio. To manufacture and deal in battery boxes, hard rubber specialties and rubber goods.

Great Western Rubber Products Co., June 8 (California), $500,000. A. T. Smith; H. L. McGregory; H. W. Kruger, Oakland, California. Principal office, 827 Chronicle Building, San Francisco, California. To manufacture automobile tires and all kinds of rubber products.

Henderson Resilient Tire Co., July 26 (Delaware), $200,000. C. B. and A. S. Bishop; E. H. Feustel, all of Wilmington, Delaware. Delaware agent, Delaware Charter Co., 904 Market street, Wilmington, Delaware. To manufacture and deal in tires and wheels for automobiles, motor trucks and other vehicles.

Inter-Continental Tire & Rubber Co., The, May 10 (Indiana), 200,000 shares of no par common stock. J. D. Wiggins, president; S. T. Davis, vice president; P. Haynes, secretary and treasurer. Principal office, Cruse and Daly streets, Indianapolis, Indiana. To manufacture automobile tires and tubes.

Jackson Raincoat Co., July 21 (Illinois), $6,000. H. Jaffe, president; L. K. Jaffe, secretary. Principal office, 1145 Blue Island avenue, Chicago, Illinois. To carry on a mail order raincoat business.

Kant Sink Manufacturing Co., Inc., August 6 (New York), $20,000. I. Mink; K. Heitler; B. De Mattia. Principal office, 221 Fourth avenue, New York City. To manufacture, sell and deal in swimming jackets.

Mallard Rubber Co., The, July 17 (Ohio), $300,000. J. H. Cox; A. M. Evans; R. S. Christian; F. Sanders; W. T. Brown. Principal office, Cleveland, Ohio. To manufacture, sell and deal in mechanical rubber goods, rubber sundries and all articles made of rubber.

Malone Rubber Co., Inc., August 13 (New York), $100,000. L. Kelly; L. F. Lehr; C. H. Cupree. Principal office, Malone, New York. To deal in rubber products.

National Consolidated Rubber Co., April 9 (Nevada), $250,000. E. R. and E. E. Dodge; W. F. Smith; H. R. Shade; E. J. Carver. Principal office, Reno, Nevada. To deal in rubber materials.

Pat & Ted Tire & Rubber Co., May 17 (California), $25,000. P. A. Walters, president, 127 North Alma street; T. J. Frickstad, vice president and treasurer, 956 South Dacotah street; E. O. Frickstad, secretary, 956 South Dacotah street, all of Los Angeles, California. Principal office, 516 East 9th street, Los Angeles, California. To sell tires, wholesale and retail, pneumatic and solid.

Reardon & Son, J. W., Inc., July 2 (Massachusetts), $25,000. J. W. Reardon, 52 Oxford street, Arlington; A. A. and I. E. Reardon, both of 73 Savin Hill avenue, Dorchester, all of Massachusetts. Principal office, Boston, Massachusetts. To manufacture, buy, sell and deal in rubber, rubber goods and all other products of a like nature.

Spencer Shoe & Leather Co., June 27 (Massachusetts), $150,000. J. E. Groat, President; C. N. Prouty, treasurer, both of Spencer; M. Cohen, Revere; A. G. Wadleigh, Lynn, all of Massachusetts. Principal office, Boston, Massachusetts. To buy, sell and deal in rubber, leather and other merchandise.

Zorn's Tire Exchange, Inc., July 20 (New Jersey), $125,000. J. S. Zorn, president; H. L. Zorn, treasurer and secretary; D. Zorn. Principal office, 9063 American Mechanic Building, Trenton, New Jersey. To deal in tires and automobile accessories.

The Rubber Trade in the East and South

Manufactured Goods

Seasonal slackening in certain divisions of the rubber industry was apparent at the close of last month, particularly the production of tires. The "cushion" of 7,000,000 tires is considered ample to meet the reduced demand occasioned by unsettled prices and cautious buying on the part of dealers. Large tire companies are operating at 25 to 50 per cent of June production, and some factories producing 500 to 1,500 tires daily are on full time.

Certain mechanical departments are on full time; footwear plants are running on summer tickets; and insulated wire production on railway signal wire and wire for building purposes continues actively to fill back orders.

Pennsylvania Rubber Co. Resumes Operations

Following a two weeks' shutdown in response to a recent demand on the part of its machine men and finishers for a flat 20 per cent increase, the Pennsylvania Rubber Co. of America, Inc., Jeannette, Pennsylvania, has now reached an understanding with its employes, who pledged their loyalty and on June 30 resumed work with wage schedule unchanged.

Through the brief period of suspension, the friendly and frank relations so long existing between the company and its employes have been mutually maintained, and beyond the settlement of immediate wage arrangements, there is a clear understanding that future expectations in connection with schedules prevailing for all departments will be based on conditions and necessities as faced by the company, rather than independent ideas of a minority.

New York

Gregory Flynn has recently become connected with The B. F. Goodrich Rubber Co., Akron, Ohio, and will make his headquarters at the company's New York City offices, at Broadway and 57th street. Mr. Flynn's work will bring him into association with the car and truck manufacturers of the New York territory.

Executives of the Ajax Rubber Co., Inc., 218-222 West 57th street, New York, N. Y., state that almost a capacity output was reached at the peak of production during the present year at the two plants maintained by the company at Trenton, New Jersey, and Racine, Wisconsin. A third unit is to be established at Sandusky, Ohio, when conditions call for such expansion. J. C. Weston is president.

Due to an increasing demand for "Double-D" tire flaps, the Dexter Rubber Manufacturing Co., Goshen, New York, has recently built an addition to its plant. Factory operations have continued for many months at practically twenty-four hours a day, and will continue for some time to come if conditions warrant. W. K. P. Baumann is sales manager.

The Hudson Tire & Rubber Corporation, 505 Proctor Building, Yonkers, New York, has recently increased its capital stock from $1,000,000 to $1,500,000. Prospects for this organization are reported as excellent, while production at the factory is steadily increasing. H. B. Seymour is vice president and treasurer.

A removal on August 1, of the organization's offices to 27 West 60th street, New York, N. Y., is announced by the Republic Rubber Company of New York.

W. D. Schwartz of L. H. Butcher Co., 239 Front street, New York, N. Y., importers of pigments and chemicals, recently returned home from Europe, where since April he has been visiting the various connections of the company.

Executives of the Pennsylvania Rubber Co. of America, Inc., Jeannette, Pennsylvania, announce that C. E. Hewitt has been recently placed in charge of the branch at Buffalo, New York, succeeding C. E. Cady.

Pennsylvania

Having recently purchased a plant at Fleetwood, Pennsylvania, for the manufacture of inner tubes, the Reading Rubber Co., Inc., Reading, Pennsylvania, will also enlarge this factory by building an addition, measuring approximately 100 by 100 feet. New machinery is now being installed, and the plant when completed will have a capacity of from 15,000 to 20,000 inner tubes a day. Samuel H. Bell is president and J. P. Stiles vice president and treasurer.

At a meeting on July 5 of the board of directors of the Traveler Rubber Co., Bethlehem, Pennsylvania, Guy de la Rigaudiere tendered his resignation as president and as a member of the board of directors. He is succeeded as president by C. W. Albert Rochow. E. E. Pollard becomes general manager. Plans regarding an increase in factory production are being formulated which include a 24-hour operating schedule.

The Carlisle Tire & Rubber Co., Carlisle, Pennsylvania, is maintaining a twenty-four hour schedule, while shipments from January to June, 1923, are 43 per cent greater than for the corresponding period of 1922. Some new equipment has been installed, as orders for the balance of the year are sufficiently large to demand uniform production. Charles S. Moomy is president and general manager.

Eastern and Southern Notes

The Bristol Co., Waterbury, Connecticut, manufacturer of recording instruments, will extend the third story of one of the present buildings, and add a second story over the old and new constructions. These improvements will more than double the present floor space of the oldest building. William H. Bristol is president.

Fred W. McConky, Jr., has been recently placed in charge of the Goodyear Tire & Rubber Co.'s branch at Charlotte, North Carolina. Mr. McConky has been connected with the Goodyear organization for several years, having previously served as manager of tire sales in the southern division.

The resignations of M. N. Whitaker and K. G. Whitaker as president and director, secretary, treasurer and director, respectively, of The DuBois Rubber & Tube Co., Chattanooga, Tennessee, were tendered and accepted at a recent meeting of the company's board of directors. S. H. Rankin was elected secretary, and J. C. Hardin was elected director to succeed M. N. Whitaker. G. L. Williams was elected director as successor to K. G. Whitaker. J. P. Bowers was elected president and treasurer.

The Rubber Trade in New Jersey

Manufactured Goods

The New Jersey rubber trade in general is undergoing the same seasonal reduction of output as experienced by the industry in other parts of the country. However, there is good reason to believe that business will be again active early in the fall.

Bergougnan Reorganization Planned

The Bergougnan Rubber Co. continues busy under the receivership of Charles E. Stokes, president of the Home Rubber Co., and Gaston Tisne, treasurer of the Bergougnan corporation. Reorganization is planned, assets, it is said, being $400,000 in excess of liabilities. Most of the liabilities are due the parent organization, the Société Generale des Etablissements Bergougnan. Banks of the United States are owed about $400,000, but the money is guaranteed by the Credit Lyonnaise, international bankers of France. The company was incorporated July 31, 1919, under the laws of Delaware.

Besides Mr. Tisne, the officers are Jules Bethier, president, and Jean Grenier, vice president and secretary. About 150 hands are employed at present.

Trenton

All the rubber plants at Trenton honored the memory of the late President Harding on August 10 by stopping work for three minutes. During that time the hundreds of rubber workers bowed their heads in respect. The Michelin Tire Co., of Milltown, closed for the entire day.

Some of the Trenton rubber manufacturers are experiencing a busy season, while others report a little seasonal dropping off in business. The majority of the Trenton concerns are running full handed. The Globe Rubber Tire Corporation has increased production due to orders received during the past few weeks, and the company is not expecting any dull season before winter. The Ajax Rubber Co. has laid off some hands because of a tire surplus, but reports that sales are good in all parts of the country, and expects improved business in the early fall. Production during twenty-six months, when the plant was in operation twenty-four hours a day, was about 50,000 tires a month. Business has become a little slack on mechanical goods at the Mercer Rubber Co., but no help has been laid off and the management expects business to pick up before this action becomes necessary.

The Thermoid Rubber Co. announces ten additional salesmen at its various branches throughout the country. J. M. Bills, formerly connected with the sales department at the Trenton office, has been sent to the Atlanta, Georgia, branch, and he will also look after the sales in the state of Virginia. Samuel K. Dennis and Leon J. Holmes have been placed in the Kansas City, Missouri, office and will also cover the field in Arkansas. J. S. Wheatley has been transferred from the Pittsburgh, Pennsylvania, branch to the San Francisco, California, office. L. S. Osgood will have charge of the tire sales at Harrisburg, Pennsylvania, while E. O. Fehnstron, stationed at the Boston, Massachusetts, office, will also cover the Maine section. C. B. Brook has been appointed to the Pittsburgh, Pennsylvania, branch under F. R. Naumer; E. J. Buss to the Rochester, New York, branch under R. J. Meredith. J. M. Kidwell is stationed at Indianapolis, Indiana, while Edward Armington has been sent to the Newark, New Jersey, branch.

In order to secure more factory space the Acme Rubber Manufacturing Co. has had plans prepared for the erection of a modern office building, which will be connected with the factory by a bridge. The building will be 80 by 40 feet, two stories high and of fireproof construction. The part of the plant in which the offices are now located will be turned over for manufacturing purposes.

The plant of the Miller-Steinert Rubber Co. has been dismantled and the machinery disposed of. Israel Albert, who purchased the plant at receiver's sale, decided not to continue the rubber business.

Equipment for the manufacture of tires and mechanical rubber goods is soon to be installed at the new plant now under construction at Trenton, New Jersey, by The Combination Rubber Manufacturing Co., Bloomfield, New Jersey. Plans call for the completion of the buildings about November 1, and the beginning of operations about January 1, 1924.

New Jersey

Articles of incorporation have been filed by the Fisk Flap Tube Rubber Co., of Trenton, with offices in the Temple Building, Camden. The company has a capitalization of $50,000 and will manufacture tires, inner tubes, and other rubber products. It will also deal in automobile accessories. The Fisk company

has arranged with a rubber concern near Philadelphia, Pennsylvania, to manufacture the tubes invented by Charles S. Fisk, formerly of Trenton, and who was for some years manager of a Trenton rubber concern. The officers of the new company are: P. T. Gravatt, president; E. K. Moore, vice president and secretary; and Charles S. Fisk, treasurer. All the officers live at West Collingswood.

That the tire industry has been more prosperous than the rest of the country is indicated, says H. K. Felton, New Jersey manager of the Michelin Tire Co., of Milltown, by the fact that the numbers of tire dealers has been increasing rapidly during the last year. Within that time 7,000 new firms in all parts of the United States have taken on the sale of tires. From September, 1922, to March, 1923, the total number of tire dealers increased at the rate of over 1,000 a month. The growth of tire retailing has been particularly noticeable among car dealers. More and more it is becoming the rule for car dealers to sell a line of tires to round out the service they sell.

The Tillinghast Rubber Co., whose plant at Stockton was destroyed by fire some time ago, will hereafter be known as the Rubber Craft Corporation. The stockholders held a meeting recently and decided to purchase a new building at Doylestown for manufacturing purposes. The officers of the company are Walker Smith, president; W. J. McLaughlin, vice president. The B. C. Tillinghast Co. will act as selling agent for the Rubber Craft Corporation.

The Dural Rubber Corp., Flemington, New Jersey, reports improved conditions under the management of Frederic M. P. Pearse, who was appointed receiver on May 3 last. William C. Ehrenfeld, formerly vice president and superintendent, is now acting as assistant receiver, in special charge of manufacturing. Robert Chris will cooperate with him in duties connected with the sales department, and will also act as secretary-treasurer. New contracts for the company are being received, and conditions in general are improving, while reorganization on a small capitalization basis is also being considered.

The recently organized Yatman Rubber Corp., 267-271 Mt. Pleasant avenue, Newark, New Jersey, has taken over the business of the former Yatman Rubber Co., incorporated in 1896, and long engaged in the manufacture of rubber erasers and molded goods. Orvis L. Gonzales, president and treasurer of the new concern, was formerly connected with The B. F. Goodrich Co. and Boston Belting Co., later organizing the Paraflex Rubber Corp. Plans are being made to develop present lines of manufacture, while under the new management plant operations are to be greatly increased. Associated with Mr. Gonzales are H. J. Yatman, vice president, and F. Haskell Smith, secretary.

The Rubber Trade in Rhode Island

The Manville-Jenckes Co.

The preliminary steps for a textile merger that may have a direct material influence on the tire industry have been taken here during the past month. When completed, the merger will form one of the largest American units in the cotton manufacturing industry. It is to be brought about through the purchase by the Jenckes Spinning Co. of Pawtucket of all the property and assets of the Manville Co., and the subsequent capitalization of the new concern, to be known as the Manville-Jenckes Co., at $39,000,000.

The combination will unite two of Rhode Island's largest manufacturing corporations. It will form an organization comprising ten plants, employing more than 5,500 persons, and operating over half a million spindles and over 10,000 looms. It will bring under one management the production of a comprehensive variety of cotton fabrics, including tire fabrics, and will be balanced with respect to southern competition by a manufacturing organization in the cotton belt.

The Jenckes Spinning Co. has been engaged exclusively in the manufacture of tire fabric. The mills of the Manville Co. produce sheetings, shirtings, linings, and fancy cotton goods. The Jenckes company has, in addition to its huge mills in Pawtucket, another at Central Falls and a southern producing unit at Gastonia, North Carolina.

The plants of the Jenckes Spinning Co., with the number of their spindles, looms, and employes, are as follows:

	Looms	Spindles	Employes
Main plant, Pawtucket	410	59,880	415
Tamarack No. 1, Pawtucket	...	33,996	325
Tamarack No. 2, Pawtucket	180	57,960	384
U. S. Division, Central Falls	...	58,180	360
Gastonia, N. C.	(not given)		

The Manville Co.'s main plant is in the village of Manville in the town of Lincoln, Rhode Island. The company operates also the Social and Norse and the Globe mills in Woonsocket, Rhode Island, and the Bernon mill in Georgiaville, Rhode Island.

The plants of the Manville Co., with the number of their looms, spindles, and employes, are as follows:

	Looms	Spindles	Employes
Manville mill, at Manville	4,000	114,648	2,000
Social, Globe and Norse, at Woonsocket	3,587	140,840	1,150
Bernon, Georgiaville	1,100	48,780	450

American Wringer Co. Reorganized

The American Wringer Co. of Woonsocket, Rhode Island, has been recently reorganized under the name of the American Wringer Co., Inc., and will continue to manufacture Horse Shoe brand clothes wringers and mechanical rubber rolls for industrial uses.

Officers of the new organization include: Harold T. Merriman, president and treasurer; William G. Roelker, vice president; and G. R. Keltie, secretary and general manager. The ten members of the board of directors are:

George Schlosser, general manager, Footwear Division, United States Rubber Co.; Harold T. Merriman, treasurer, Lippitt Woolen Co., Woonsocket, Rhode Island; William G. Roelker, vice president, Industrial Trust Co., Providence, Rhode Island; Frederic Howe, vice president, Crompton-Knowles Loom Works, Worcester, Massachusetts, and Providence, Rhode Island; Edward H. Rathbun, president, Rathbun Knitting Co.; Harry Salomon, trust officer of the Rhode Island Hospital Trust Co., Providence, Rhode Island; Robert J. B. Sullivan, Providence, Rhode Island; Frank D. Lisle, Brown, Lisle & Marshall, Providence, Rhode Island; Earl S. Colman, Richardson & Clark, Providence, Rhode Island.

The American Wringer Co. was originally established in 1891, and represented a merger of four organizations.

Rhode Island Notes

The new brick extension to the boiler room of Columbia Narrow Fabric Co. mill at Shannock is completed and the new 100-horsepower boiler for oil burning is installed. The original coal burning boiler is also to be converted into an oil burner and the installation of the heating and sprinkling system of the new weave shed has also been completed. Among the other improvements is the 32 by 18 feet addition to the old stone mill to be used as a storehouse for mechanical parts in use in and at the plant. Four of the 13 new houses being erected by the company on Columbia Heights are now ready for occupancy and the others will be ready before snowfall. The new water system for Columbia Heights is also installed.

Early in August it was announced that negotiations for the sale of its holdings in Putnam, Connecticut, and Taunton, Massachusetts, were being conducted by officials of the Manhasset Manufacturing Co., which until recently maintained headquarters in this city. At the same time it was announced that the offices of the corporation located in the Turks Head building, Providence, would be removed to Putnam, to effect economy, and the resignation of William A. Vermilye, treasurer of the corporation, a resident of Providence, was announced.

The factory of the National India Rubber Co. at Bristol, after a two weeks' shutdown, resumed operations August 6 in all depart-

ments. During the time that the plant was closed the annual inventory of stock was taken and there was a general overhauling and repairing of machinery.

The Rubber Trade in Massachusetts

Manufactured Goods

The acute shortage of rubber footwear so keenly felt last winter is not likely to occur again this coming season. Retailers have placed early orders for stock replenishment and manufacturers are busy, following the annual summer shut-downs. To insure a supply of the desired styles and sizes dealers were urged to order about May 15 for delivery about September 15 and the response has been good. Rubber heel demand, which diminished somewhat in recent months owing to shoemakers' strikes, has picked up again, following the complete failure of the strikes and the resumption of operations in the factories of Brockton and elsewhere.

The new price lists of tennis lines which became effective August 1 are practically the same as for last season, any advances averaging less than 1 per cent. Owing to the unusually cool weather, especially in New England, the tennis business has been rather disappointing this year, particularly in respect to repeat orders.

Most tire manufacturers are operating on a somewhat reduced production schedule, owing to the present overproduction of stocks and the seasonal slackening of new car sales. The proofing branch of the industry continues satisfactory. Automobile topping production has been well maintained, and the demand for raincoat cloth has improved following the gradual adjustment of the garment workers' strike.

Mechanical goods business is still seasonally quiet, while insulated wire output continues large, but competitive prices are being felt here as elsewhere in the country.

Statistics Show Seasonal Quietness

The seasonal summer quietness of rubber goods manufacturing in this state was indicated by the published data of the Massachusetts Department of Labor and Industries. In June the nine manufacturers of tires and other rubber goods reporting employed an average of 2,987 employes who earned a weekly average of $27.92 for a seven-hour day. This compares with an average of 14,476 employes earning a weekly average of $25.28 in the nine establishments reporting six months ago, in December, 1922.

Potential Rubber Heel Demand Continues

The national styles report for the third quarter of the year, compiled by the styles committee of the National Shoe Retailers' Association, indicates the widespread general adoption of rubber heels for men's shoes, it being stated that leading manufacturers in the principal footwear centers are equipping from 85 to 95 per cent of their product with rubber heels. It is evident, therefore, that the recent quietness of the rubber heel trade was without significance and due entirely to factory shut-downs resulting from labor difficulties in some of the largest footwear producing cities. Already the resumption of shoe factory operations has again stimulated heel demand. Public approval of the comfort and economy of rubber heels steadily increases.

Massachusetts

The Stedman Products Co., South Braintree, is operating to capacity in both its reclaiming and flooring divisions. This firm is exhibiting with pride a photograph of President Coolidge made at its plant on the occasion of his address to Stedman employes in 1912 when first coming into political prominence. Stedman employes recently held their annual outing at Scituate, where sports, a clam bake and dancing were enjoyed and prizes awarded in swimming and fishing contests.

It is reported that the Endicott-Johnson Corporation will manufacture rubber heels for its leather footwear output, said to total about 100,000 pairs daily.

The Converse Rubber Shoe Co., Malden, resumed operations on August 20, following its annual shut-down for vacations, repairs and machinery overhauling. Orders for heavy rubber footwear are booked well ahead and a busy season is anticipated.

Sydney C. Stanley, who has for the past year successfully represented the Hanover Rubber Co. on the North Shore of Massachusetts, has joined the sales force of the Quabaug Rubber Co., North Brookfield, and will sell Armortred heels and soles in the same territory.

The Hood Rubber Products Co., Watertown, on August 1 took over as a branch the business of Simon Miller & Sons, Philadelphia, Pennsylvania, for many years wholesale distributors of Hood products. F. F. Wickes, southern sales manager, has been appointed manager of the new branch. Mr. Wickes served fourteen years in the Hood production department and two years in the sales, where his advancement has been rapid.

The Panther Rubber Co. and the Panco Rubber Co., Chelsea, have a new salesman in the person of L. I. Fitzgerald, of Boston, who will cover the shoe factory trade in heels and soles. Mr. Fitzgerald has a successful selling record with several rubber companies.

The Sanford Rubber Works, Inc., has been organized to take over the business of the Phillips Rubber Co. at 38-45 Main street, Cambridgeport, where the principal office of the firm is now located. The product consists of molded goods, heels and soles, and contract work. Sanford patented textile rubber products will also be made and marketed under the trademark "La Textex." The officers of the company are Oliver P. Hussey, president; Joseph R. Sanford, secretary; Samuel M. Sanford, treasurer.

Sales made by the Hood Rubber Co., Watertown, for the first quarter of the fiscal year show a gain of more than $800,000 over the corresponding period of 1922. At the company's plant a production also of 1,800 tires a day continues to be maintained.

Edward L. Shaw has been recently elected president of The Glendale Elastic Fabrics Co., Easthampton, while William Astill has been appointed treasurer and general manager, succeeding George Astill, deceased.

The Rubber Trade in Ohio

Manufactured Goods

Curtailment of production is now being put into effect by Ohio tire manufacturers as a result of the accumulation of stocks, which at the end of June were the largest recorded since the beginning of 1922. While the reductions in working forces in some instances are larger than had been anticipated earlier in th yar they are not considered serious and are looked upon as temporary expedients for preventing danger of overproduction.

Akron-Made Brunswick Tires

Press reports state that The B. F. Goodrich Co., Akron, has recently bought the tire business of the Brunswick-Balke-Collender Co., Chicago, Illinois, the Brunswick organization retaining a very small interest. Under the new management Brunswick tires will be manufactured at Akron, instead of at Muskegon, Michigan, as formerly. The formation of the Brunswick Tire Co. as a subsidiary of the Brunswick-Balke-Collender Co. was only recently announced, and tire production has been averaging 2,000 casings a day.

B. E. Bensinger and H. F. Davenport, president and secretary, respectively, of the Brunswick-Balke-Collender Co., will act as president and vice president of the newly-formed organization, with T. A. Dwyer as secretary. Executive offices will be maintained in New York, N. Y., but sales will be handled from Akron by R. McTammany, formerly of the Goodrich company, assisted

by E. H. Brandt, formerly assistant sales manager of the Brunswick-Balke-Collender Co.'s tire division.

Founder of India Rubber Review Retires

Theodore E. Smith, the founder and former president of the *India Rubber Review*, and identified for the past twenty years with business activities of Akron, Ohio, recently announced his intended retirement from public life and removal from Akron to his estate, "Friendship Fruit Farm," at West Camp on the Hudson River, New York. This action was determined upon last spring after an injury received in Akron when Mr. Smith was struck by an automobile, one of his legs being fractured.

Previous to his departure from the city Mr. Smith was the recipient of the best wishes of his many friends in Akron and elsewhere, he having been prominent not only in the publishing field, but also identified with banking and other interests. A series of farewell receptions and dinners in his honor were tendered by business associates and members of the Akron Rotary Club, of which he was twice president, and at all of these affairs he received many touching and glowing tributes. At various times Mr. Smith had been president of the Red Cross, Union Mission, Travelers' Aid, Charity Organization Society, and Better Akron Federation. Although removing from Akron Mr. Smith will continue his active interest in the *India Rubber Review*, and he remains one of its directors.

National Aeronautical Association

The city of Akron now represents the largest center in the country for the manufacture of lighter-than-air ships, and was the fourth city to complete the organization of a chapter. The present executives of the Akron chapter of the National Aeronautical Association are as follows:

President, P. W. Litchfield, vice president and factory manager, The Goodyear Tire & Rubber Co.; Vice President, John Gammeter, The B. F. Goodrich Co.; Secretary, Hugh Allen, The Goodyear Tire & Rubber Co.; Treasurer, Norman G. Nelson, cashier, National City Bank.

The following are directors: F. A. Seiberling, president, The Seiberling Rubber Co.; Fred Smith, Summit County Commissioner; J. W. Thomas, vice president, The Firestone Tire & Rubber Co.; J. B. Huber, former president of Akron Chamber of Commerce; D. C. Rybolt, Mayor of Akron.

Akron

Akron rubber factory officials are unanimous in their opinion that the bottom has been reached in the midsummer curtailment in their plants. They point out that orders are already increasing, which will insure a steady improvement in the industry this fall. Production is now being increased as fast as new business comes in.

Since the completion of its new factory additions, the General Tire & Rubber Co. has been one of the few companies which has been increasing production. This company does not cater at all to the original equipment business, and handles its products entirely through dealers.

R. M. Sanderson, for many years connected in various capacities with rubber organizations, has recently become affiliated with The India Tire & Rubber Co., Akron, Ohio.

The Sun Rubber Co. has developed a new hard rubber steering wheel for automobiles that will last as long as the wooden wheel and look better. The demand continues strong for radio materials, which are the chief products of the plant. The company, of which J. T. McLane is president, recently took over the plant of the Marlanite Rubber Co. in Barberton. Other officers are T. W. Smith, Jr., vice president, and J. S. Bennett, of Akron, general manager.

Williams Tire & Rubber Co. has taken over the modern steel and concrete building on South High street formerly occupied by the Rubber City Clearing House Co. The company, of which Charles Williams is president, is one of the oldest in Akron specializing in tire and tube distribution.

The new plant of the Northern Rubber Co. in Barberton will be opened within the next few weeks, according to officials of the company. Machinery is now being installed. The plant will be operated at four times the present production, with a large force of workers, it is announced.

Ohio Notes

The Evans Lead Co. has recently established its general sales offices at 802-4 Keith Building, Cleveland, Ohio, and is now producing all grades of lead oxides, red lead, litharge, and orange mineral. S. Marshall Evans heads the organization.

R. W. Llewellyn has been recently appointed manager of the Miller Rubber Co.'s Cincinnati, Ohio, branch. Mr. Llewellyn has been connected with the Miller organization for several years.

The Eclat Rubber Co., Cuyahoga Falls, Ohio, specializing in all kinds of rubber tubing, is now increasing its production about 25 per cent. New machinery is also being installed. W. H. Stillwell is president and Eugene F. Ast is secretary and treasurer.

New sales records for 1923 are being made by The Dayton Rubber Manufacturing Company of Delaware, Dayton, Ohio, and prospects for fall business are said to be excellent. Approximately 1,000 tires a day are now being manufactured. Robert F. Brown is treasurer.

The Studebaker-Wulff Rubber Co., Marion, Ohio, has recently added to its earlier acquisitions the plant and property of the concern formerly known as the Liberty Tire Corporation, at Carey, Ohio. The combined capacity of the plants is estimated as being between 1,500 and 2,000 tires a day, while the present production of 500 casings and 1,000 inner tubes is to be gradually increased with the development of the organization.

The I. T. S. Co. of Ohio, Elyria, Ohio, represents the merging of the interests of the former I. T. S. Rubber Co. and The International Patent Heel Co. of Delaware. Some changes have been made in the plan of organization, while the new company, owning foreign patents, expects to have a wider field than the earlier concern. The officers and directors, however, of the new organization are identical with those of the I. T. S. Rubber Co.

The Ra Clare Rubber Co., Inc., Delaware, Ohio, originally known as the Delaware Rubber Co., was recently organized with a capital stock of $20,000, and will engage in the manufacture of rubber toys and novelties. The officers are: C. H. Mansfield, president; C. J. Stegner, vice president; and Ray W. Brayley, secretary and treasurer.

Since the taking over of the plant of The Republic Rubber Co., Youngstown, Ohio, by the Lee Rubber & Tire Co., Conshohocken, Pennsylvania, the production at the former's factory has continued to be most satisfactory. Officials state that the manufacture of mechanical rubber goods in 1923 to date was 100 per cent larger than for the corresponding period of 1922, and the volume of the 1922 period was 88 per cent larger than that of the year preceding. There is also no slackening in the pneumatic tire business, the July production at the Republic plant being the largest for several months, while the outlook for the future is most promising. E. H. Fitch was recently elected president of the Republic organization, succeeding C. H. Booth, receiver, who has resigned.

The Pharis Tire & Rubber Co., Newark, Ohio, is operating with night and day shifts on orders. The present output averages 1,000 tires a day, while extensive changes are being planned which will bring tire production up to 2,000 tires a day. A corresponding increase in tube manufacture is also contemplated. The executive personnel of the Pharis organization remains practically unchanged since the company's establishment in 1912.

J. W. Lord has been recently appointed by the Pennsylvania Rubber Company of America, Inc., Jeannette, Pennsylvania, as manager of its branch at Cleveland, Ohio.

The Rubber Trade in the Midwest

La Crosse Rubber Mills Co.

The construction of another large addition to the plant of the La Crosse Rubber Mills Co., La Crosse, Wisconsin, represents a further advance in the development of this well-known organization. Incorporated in 1897, with a capital stock of $40,000, the concern is now capitalized at $1,300,000, while over $1,000,000 is invested in buildings which constitute one of the largest rubber shoe factories of this country.

Under the leadership of the present executives who took control of the organization in 1900, several new lines of production were adopted, while in 1905 the company began its manufacture of rubber footwear, which was to become its specialty. Under present plans there will be eventually a daily production of from 25,000 to 30,000 pairs of tennis and other makes of shoes, as well as rubber boots. The new four-story construction with power plant, which will cost approximately $200,000, will provide 75,000 additional square feet of floor space, the total being 350,000 square feet.

The present officers include: A. Hirschheimer, president; M. Funk, vice president; Albert P. Funk, secretary and manager; and Arthur S. Funk, treasurer and assistant manager.

Plant of the La Crosse Rubber Mills Co., La Crosse, Wisconsin

Midwest Notes

Although a receiver has been appointed for the Marathon Rubber Products Co., Wausau, Wisconsin, makers of raincoats, rubberized fabrics, etc., there is no interruption of plant operations, and it is believed that a settlement of the company's financial difficulties will soon be forthcoming. A. Burnett is the receiver.

A new organization, known as the Superior Insulating Tape Co., 3044 Lambdin avenue, St. Louis, Missouri, has purchased the equipment of the St. Louis Rubber Cement Co., and is now engaged in the manufacture of friction and rubber tape. E. F. Olson is vice president of the new concern.

The India Tire & Rubber Co., Akron, Ohio, has recently opened a warehouse branch at 1425-1427 Locust street, Kansas City, Missouri, with George P. Coleman in charge. Mr. Coleman was previously connected for several years with the Dayton Tire & Rubber Co. Others employed in this branch are J. M. Tanner, F. H. Cunningham, B. R. Burgess and W. B. Pifer. Mr. Pifer will travel in Iowa and Nebraska.

The Kokomo Rubber Co., Kokomo, Indiana, manufacturer of "Kokomo" tires and tubes, is running its plant at double the usual rate, and is turning out about 1,400 tires a day. This schedule for production will be continued for some months, with a daily output of about 3,000 tubes. Randolph Mitchell is general manager.

The Converse Tire Co., a subsidiary of the Converse Rubber Shoe Co., Malden, Massachusetts, has been recently authorized to do business in the state of Illinois, with offices at 612-618 West Jackson Boulevard, Chicago, Illinois. The company plans to manufacture, buy, sell and deal in tires, automobile accessories, and certain goods made wholly or partly of rubber; also to deal in crude rubber and compounds. M. L. Paterson is in charge of the Chicago branch.

The recently organized Armstrong Rubber Co. of Illinois, 1223 South Wabash avenue, Chicago, Illinois, will for the present act only as distributor for the Armstrong tire in the Middle West. G. F. Armstrong is president and treasurer of the new concern and F. A. Winship is secretary.

Due to the death of Henry Woodland, formerly secretary and treasurer of Allis-Chalmers Manufacturing Co., Milwaukee, Wisconsin, new executives have been chosen as follows: W. A Thompson, formerly comptroller of the company, becomes secretary and comptroller, while Raymond Dill, lately assistant treasurer, has been elected treasurer.

After a short intermission of limited production, operation at normal capacity has been resumed at the plant of the International Rubber Company of America, Anderson, Indiana. The company specializes in the manufacture of "Long-Wear" automobile tires. H. W. Lantz is factory manager.

"Omaha-Made Tire Week" was celebrated August 6 to 11 in the city of Omaha, Nebraska, by the three tire factories of that city, the Overland Trail Rubber Co., the Nebraska Tire & Rubber Co., and the Sprague Tire & Rubber Co., these organizations pooling their interests for the time being and making the campaign together. Many visitors were received at the three plants, where competent guides explained operations.

The Overland Trail organization, with offices at 30th and Taylor streets, has been running its plant continuously for the past two years, part of the time on one ten-hour shift, and sometimes on two eight-hour shifts. During the months of April, May, and June, the output was 850 tires and 1,000 tubes a day, although with additional machinery installed since that time the company is now in a position to produce daily about 1,100 tires and the same number of tubes. T. E. Huff is secretary of the organization.

The Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pennsylvania, has prepared plans for a new branch to be constructed on Milwaukee avenue, Kansas City, Missouri, and building operations are to begin shortly. The structure, which will be three stories in height, with a total floor area of 30,000 square feet, is designed to serve as office, warehouse and service station.

OF THE BELTING IN USE IN ONE OF THE DISTRICTS OF YUCATAN, balata is the most popular material, comprising 50 per cent of the amount necessary, while rubber belting is represented at 2 per cent. Belting is used mainly for hemp-stripping machinery.

The Rubber Trade on the Pacific Coast

Manufactured Goods

Rubber trade conditions on the Pacific Coast are excellent, according to the best informed leaders in the industry. Summer has brought some slackening in activity in several lines, but the slowing up is even less than that of the same period a year ago. In building lines there has been a marked increase in demand and production. A broadening interest in floor covering is shown in an increasing use of rubber matting and the demand for rubber tiling in office buildings, first class apartments, and other structures. The mining industry is getting very busy, and rubber manufacturers are receiving a share of this benefit that in a sense offsets the curtailing of activity in the oil well industry. Tire sales are well above the usual seasonal demand, and motor car sales much above the record for the same period a year ago. Dealers in repair material find a ready market for a large volume of their products. Incidentally they report that vulcanizers are more exacting as to quality of materials, an indication, they say, of better work being done by tire repair men.

Los Angeles Challenges New York

The position long held by San Francisco and Seattle as leading ports of entry for crude rubber is being challenged by Los Angeles, which is waging an aggressive campaign among American importers and East Indian exporters of crude rubber to make their shipments via the port of Los Angeles. It is contended that fully three weeks can be saved by shipping rubber from Singapore through Los Angeles to Akron instead of sending it through the Panama Canal to New York and then forwarding it to Akron, and without appreciable extra expense. Los Angeles, which in 1922 produced $11,131,301 worth of manufactured rubber goods, imported a large part of its raw material directly from Singapore.

Los Angeles

Excavation for the new building for the United States Rubber Co. at 8th and San Pedro streets was begun August 13. The structure will be three stories high, 122 by 142 feet, and of reinforced concrete. Branch Manager J. B. Magee expects the building to be ready in January. The branch has increased its force of road salesmen from 30 to 35.

To meet a considerable increase in business, the Long-Turney Corporation, 1920 East Vernon avenue, is adding considerably to its equipment, having recently installed four hydraulic presses. The concern is making a novel solid tire, also tread stock, repair material, oil well and druggists' supplies, and various staples and specialties in hard rubber and soft molded goods. The working force is being steadily increased. Emmet S. Long is president.

The Elaterite Varnish & Rubber Co., 5490 S. Alameda street, capitalized at $2,500,000, is selling a large block of its stock to raise funds for expansion of its plant. The concern is said to control 95 per cent. of the mineral rubber deposits in Duchesne county, Utah. The officers are: Charles H. Judd, president; Waller G. Chanslor, vice president; John B. Brokaw, treasurer; D. G. McDonald, secretary; all of whom, with Geo. W. Turney, are directors.

C. W. Sprenger, manager of the heel department of the Pioneer Rubber Mills, San Francisco, was a Los Angeles visitor recently.

All bids on a large quantity of rubber cotton-jacketed fire hose have been rejected by the City Council of Los Angeles, and new proposals will shortly be sought. Many manufacturers throughout the country competed for the orders.

A new unit with which the factory can increase its output of red inner tubes to 1,400 daily is being added by the Reilly Rubber Co., 2432 E. 56th street, of which J. R. Reilly is president. The factory, which makes nothing but tubes, was started in May, 1922.

The Eno Rubber Corporation, 1026-1030 S. Los Angeles street, of which Roy C. Musser is president, contemplates making tires as well as tubes within a few months. The concern also makes a general line of mechanical rubber goods and patented specialties and reports business holding up remarkably well.

Normal seasonal production is reported by The Goodyear Tire & Rubber Co. of California, with unit production somewhat ahead of August, 1922. The big works closed August 1 for the employes' annual outing at Redondo Beach.

The India Tire & Rubber Co., Akron, Ohio, opened in August its new office and commodious warehouse at 843 Traction avenue. D. A. Grubb, secretary-sales manager, and P. C. Searles, treasurer, of the company, came from Akron to attend the opening and confer with the newly appointed representative, J. P. Schiller, who was formerly with The B. F. Goodrich Co. branch in San Francisco. The new headquarters will supply Southern California and Arizona.

The Paragon Rubber Co., 4827 Huntington Drive, organized about a year ago, has been operating only since March. The concern makes repair materials and general mechanical goods, has an up-to-date equipment and is constantly adding new machinery. H. G. Cogswell is president; L. A. Parker, vice president; J. B. Plasman, secretary; and A. H. Cogswell, treasurer.

Executives of the Samson Tire & Rubber Corporation, Compton, California, state that Earle L. Davies has recently become affiliated with their company, and will serve as technician in charge of the chemical and development departments. A. Schleicher is president and general manager of the Samson organization.

San Francisco

At its plant in Pittsburg, Contra Costa county, the Pioneer Rubber Mills of San Francisco has just started work in its newly erected unit for wrapped hose. The building is 80 by 438 feet, and is said to be one of the best equipped in the country. Another unit recently opened was that for making battery jars. Another department that is doing exceptionally well is the heel unit, opened in January. Several departments are working on 16-hour shifts and a few on 24-hour shifts. There has been no change in the executive personnel.

The Western Rubber Ace Co., 312 Clay street, of which E. J. Palmer is president, is planning the erection of a factory to make tires hitherto supplied from the main works in Elgin, Illinois. The tire is a dense sponge rubber ring somewhat horseshoe-like in cross section, in the center of which is a wedge ring of sponge rubber. The whole is substituted for an inner tube.

J. B. Lanktree has been appointed by Superior Judge T. W. Harris as temporary receiver of the Coast Tire & Rubber Co., which has an authorized capital of $5,000,000 and a plant at 50th avenue and E. 12th street, Oakland. Mr. Lanktree succeeds S. H. Kittle, who was installed as receiver by the directors when they were indicted recently by a San Francisco grand jury for alleged mismanagement. Judge Harris also enjoined the directors from voting a $1,000,000 block of stock which they control, the court declaring such injunction necessary to protect the receiver and numerous stockholders.

Charles B. Raymond, vice chairman of the board of directors of The B. F. Goodrich Co., Akron, Ohio, was a recent visitor on the Pacific Coast and conferred with the company's leading representatives here. He found business prospects very encouraging, he said.

A decided improvement in sales of the new model non-skid tire in various sizes is reported by the Pacific Coast branch, 636 Van Ness avenue, of the Keaton Tire & Rubber Co., Chicago, Illinois. J. H. Keaton is head of the Pacific Coast concern.

"Rubber Machinery," by Henry C. Pearson, should be in the library of every rubber company.

Activities of the Rubber Association of America

President of the Rubber Association of America

FOLLOWING the recent death of Horace De Lisser, president of the Rubber Association of America, W. O. Rutherford, first vice president, became ranking head of the organization and at the directors' meeting on July 26 was elected president.

W. O. Rutherford

Vice president in charge of sales of The B. F. Goodrich Co., Akron, Ohio, Mr. Rutherford, although one of the younger officials in the rubber industry, is one of the oldest in point of service, and this fall will have completed his twenty-third year of service in the Goodrich organization. In 1900 he entered the company's employ in a minor position in the sales department and has won successive promotions up to his present important position in the Goodrich company through able leadership.

His first real advancement was to a position in the sales force of the Detroit, Michigan, branch. In 1900 he was appointed manager of the Denver, Colorado, branch, and a year and a half later was promoted to branch manager at Buffalo, New York, where for eight years he was largely responsible for the popularity of Goodrich products in that district.

In 1910 he was brought back to Akron as assistant to H. E. Raymond, vice president and general sales manager, and four years later was appointed assistant general sales manager. In 1916 he was made general sales manager and director of the company in full charge of the selling of one of the most extensive rubber goods lines manufactured in America, embracing at that time seventy-odd branches and some five hundred salesmen.

Continuing his unbroken record of real achievement he was a few years later elected vice president in charge of sales and a member of the executive committee. To this important position he brought the ripe experience of a successful field salesman, marked executive ability, and a rare knowledge of men and of how best to inspire them with his own enthusiasm and aggressiveness. With a conspicuous talent for organization, he has few peers in his capacity for keeping sales enthusiasm at white heat. He has time and again demonstrated his ability to handle big situations in the selling field, and his sales direction has been largely responsible for Goodrich prosperity.

Mr. Rutherford has long been an active member of the Rubber Association of America. He was first elected a director in 1916, second vice president in 1922 and first vice president at the last annual election. His committee work has been notable and as president he may be depended upon for that real aggressive leadership, clear vision and good judgment so necessary in these critical times, and which have characterized all his activities in the past. A man of pleasing personality, he has the rare and happy faculty of getting things started and finished as they should be, with an increasing number of friendships in the bargain.

Mr. Rutherford registered in the last draft during the war. For a number of years he has served as vice president and a director of the Motor and Accessory Manufacturers' Association and this year was elected president. He is the first man to head this and the Rubber Association at the same time. Last year he did important work as chairman of the foreign trade commission of the Motor and Accessory Manufacturers' Association.

The Rubber Association may well regard with satisfaction the succession of the presidency into such able hands, following the unfortunate death of Mr. De Lisser.

Changes in Executive Personnel

Two vacancies occurring in the Board of Directors due to the death of Horace DeLisser, of the Ajax Rubber Co., Inc., and the resignation of J. N. Gunn, former president of the United States Tire Co., have been announced. The Board was unanimous in electing C. B. Seger, chairman of the Board and president of the United States Rubber Co., and George E. Hall,

Report of Inventory—Production—Domestic Shipments of Pneumatic Casings—Inner Tubes—Solid Tires

	Pneumatic Casings				Inner Tubes				Solid Tires			
	No. Mfrs. Reporting	Inventory	Production	Shipments	No. Mfrs. Reporting	Inventory	Production	Shipments	No. Mfrs. Reporting	Inventory	Production	Shipments
1922												
June	64	5,042,147	2,838,890	3,133,260	64	6,186,534	3,130,629	3,073,679	11	169,808	66,089	63,408
July	63	4,834,106	2,476,636	2,695,095	63	5,675,839	3,068,199	3,630,744	11	176,375	71,505	60,425
August	63	4,629,392	2,905,209	3,029,823	63	5,207,228	3,808,224	4,220,055	11	189,698	84,313	69,435
September	64	4,612,037	2,504,744	2,502,106	64	5,164,757	3,501,442	3,558,971	11	200,016	82,767	66,797
October	64	4,682,958	2,674,662	2,588,770	64	5,488,033	3,787,758	3,420,680	11	213,942	85,480	71,275
November	62	4,964,976	2,733,134	2,379,708	61	6,210,053	3,850,908	3,075,023	11	234,684	85,775	61,466
December	59	4,599,208	2,656,942	2,934,079	59	5,732,125	3,411,074	3,825,949	10	244,061	77,221	64,570
1923												
January	62	4,695,916	3,127,270	2,994,297	62	5,838,310	3,951,885	3,748,651	11	262,462	83,343	60,611
February	60	5,224,387	3,217,987	2,588,639	60	6,771,958	4,039,202	3,001,697	11	270,191	75,457	63,394
March	58	5,670,601	3,865,726	3,322,637	57	7,740,945	4,875,414	3,828,315	11	265,843	79,788	77,144
April	56	6,088,272	3,539,326	2,976,160	55	8,394,184	4,259,558	3,535,635	11	260,631	71,468	72,609
May	57	6,906,594	3,659,986	2,757,764	57	9,292,223	4,317,537	3,414,115	10	268,323	77,288	67,147
June	55	7,040,600	2,956,943	2,502,185	54	8,924,326	3,590,011	3,581,060	10	283,425	72,445	52,126

"Production" and "Shipment" figures cover the entire month for which each report is made. "Inventory" is reported as of the last day of each month.
"Inventory" includes tires and tubes constituting domestic stock in factory and in transit to, or at, warehouses, branches (if any), or in possession of dealers on consignment basis, and as a total represents all tires and tubes still owned by manufacturers as a domestic stock.
"Shipments" includes only stock forwarded to a *purchaser* and does not include stock forwarded to a warehouse branch, or on a consignment basis, or abroad.
Compiled by The Rubber Association of America, Inc.

president of the Boston Woven Hose & Rubber Co., to fill the vacancies and to serve until the next meeting of the association.

The death of Mr. DeLisser also caused a vacancy in the office of president of the association. W. O. Rutherford, first vice president, was unanimously chosen president, while G. M. Stadelman and C. B. Seger were also unanimously elected first vice president and second vice president, respectively. The board also empowered the president to fill all vacancies which may exist in committees.

Association Notes

The original Tire Equipment Committee, composed of the executives of the tire manufacturers supplying original equipment to automobile manufacturers, met in New York on August 7 and discussed general conditions obtaining in that trade.

On August 8 the Executive Committee of the Tire Manufacturers' Division held a special meeting with a committee representing the Tire and Rim Association of America, Inc. The standardization of cross-sectional widths of the so-called "balloon" tire was the subject considered, but it was passed for discussion at the September regular meeting of the Tire Executive Committee, when it is expected final action will be taken thereon.

The Service Managers Committee of the Tire Manufacturers' Division met in Cleveland on August 13 and 14 to prepare an educational pamphlet on the care of truck tires, the contents of which will be devoted to matter similar to that contained in the association's booklet entitled "The Care of Pneumatic Tires," which has received such widespread approval throughout the trade. Adjustment conditions in general, and ways and means by which they might be improved, also received attention.

An order for an additional million copies of "The Care of Pneumatic Tires" has been given to the association's printer. Two million copies have already been distributed throughout the country.

TWELFTH ANNUAL SAFETY CONGRESS

The Twelfth Annual Safety Congress, under the auspices of the National Safety Council, will be held October 1 to 5, at the Hotel Statler, Buffalo, New York. Meetings of the Rubber Section will take place during the mornings of October 3 and 4, and a joint meeting of Chemical and Rubber Sections is scheduled for the morning of October 2. At all these sessions there will be helpful discussions in connection with the following subjects: "Safety Devices for Mills and Calenders"; "Fire Prevention in Spreader Houses"; and, "Elimination of Occupational Diseases in the Chemical and Rubber Industries." The program includes the following addresses: "Safe Handling of Solvents"; "Safety from the Standpoint of the Executive"; and, "Examination of Employes from Standpoint of Occupations in the Rubber Industry." Various committees will also make reports.

E. W. Beck, of the United States Rubber Co., is chairman of the Rubber Section, while the vice chairman and secretary are, respectively, C. T. Wilson, of the Kelly-Springfield Tire Co., and A. M. Partridge, of the Fisk Rubber Co.

NATIONAL FIRE PREVENTION EXPOSITION

The first National Fire Prevention Exposition, with which will be associated an International Fire Prevention Congress, will be held during the week of October 8, 1923, at the 71st Regiment Armory, New York, N. Y. In view of the fact that the year 1922 recorded the highest fire losses ever known, those responsible for the exposition are urging the cooperation not only of the various industries but also of the general public in an attempt to improve conditions which could make such losses possible. At the exposition hundreds of devices and processes that have been tested by Underwriters' Laboratories with reference to eliminating their natural fire hazard, or to demonstrating their ability to protect from fire, will be presented, while no manufactured products will be permitted on exhibition which have not successfully withstood such tests. Measures which aim toward public safety, and which are constructive rather than merely theoretical, are being carefully considered by representatives of many national organizations.

CHEMICAL EXPOSITION SEPTEMBER 17-22

The Ninth National Exposition of Chemical Industries will be held September 17-22, 1923, at the Grand Central Palace, New York, N. Y. New developments in the chemical industry and the progress of chemists and chemical engineers will be disclosed at this exposition by comprehensive exhibits, informing lectures and moving pictures.

The special features of interest to rubber men will be exhibits by the New Jersey Zinc Co., the Magnesia Talc Co., the Southern Minerals Corporation, and other organizations. In addition to the general line of rubber chemicals and machinery, several new accelerators and compounding ingredients will be demonstrated.

The annual banquet and election of the Salesmen's Association of the American Chemical Industry will also be held during the week of the Exposition, and the regular dinner of the American Institute of Chemical Engineers will be on Wednesday evening, September 19, at the Park Avenue Hotel.

There will be no chemical show in 1924, as sixty per cent of the exhibitors voted in favor of a biennial exposition; therefore, the next show will be held in 1925, by the same management.

MEETING OF THE RUBBER DIVISION A. C. S.

The American Chemical Society will meet in Milwaukee, Wisconsin, September 10-14, at the Auditorium and Pfister Hotel. The following is the Rubber Division program:

SEPTEMBER 13. A. M. AND P. M.

1. E. N. Cole Coolidge and C. E. Boord. Proof that Diphenylguanidine is a "Hydrosulphide" Accelerator. Lantern.
2. H. W. Greider. The Influence of Glue on the Reinforcing Effect of Light Magnesium Carbonate in Rubber. Lantern.
3. Ira Williams. The Plasticity of Rubber and Its Measurement. Lantern.
4. A. G. Emery and W. H. Whitcomb, Laboratory Vulcanizer with Multiple Compartments. Lantern.
5. L. B. Sebrell and W. W. Vogt. The Acceleration of Vulcanization. I. The influence of the Non-Rubber Constituents on the Physical and Chemical Properties of Rubber Stocks. Lantern.
6. L. B. Sebrell. The Acceleration of Vulcanization. II. The Relation of Structure to Curing Power.
7. C. Olin North. Comparison of Sprayed Rubber with Smoked Sheets in a Commercial Tread Stock.
8. Ellwood B. Spear and Robert L. Moore. Effect of Overmilling and Duration of the Curing Time on the Quality of Rubber Compounds.
9. Committee Reports and Business Meeting.
   Crude Rubber Testing; Report and Discussion, 1 hour.
   Physical Testing Methods, 10 minutes.
   Miscellaneous Committees, 10 minutes.
   General Business, 15 minutes.

RUBBER FOOTWEAR IN FIUME

Rubber shoes and boots are handled in Fiume only by small retail shops. Owing to the favorable rates of exchange, Austrian manufacturers have practical control of the market for rubber footwear, dividing the market in other rubber products with Italian manufacturers. The greater demand is for rubber boots needed by ships' crews, says Consul North Winship.

The Rubber Trade in Great Britain

By Our Regular Correspondent

Tire Trade Situation Unsatisfactory

THE tire situation, which has long been unsatisfactory owing to foreign competition, has been rendered more acute by the recent cut in prices abroad, and which the home makers had to follow, much against their inclinations. Continuous efforts are being made both inside and outside Parliament to get some protection afforded by the imposition of a duty on imported tires, but from official statements there seems to be little hope of success in this direction.

The way in which the war penalized the home maker, while allowing his competitors an exceptional opportunity for booming their goods, has been often stated, but official excuses seem to be always on tap when retribution is proposed. To a large extent appeals to motorists to support the home industry have fallen upon deaf ears and it may as well be recognized that like the buyers of other classes of goods the motorist is mainly swayed in his purchases by considerations of his own pocket. Of course the whole position centers upon the old political fight of free trade versus protection, a matter which as far as the rubber trade is concerned is complicated by a want of unanimity among the manufacturers. Although they are very likely in a decided minority, yet it is probably quite correct to say that thick and thin upholders of free trade are to be found in the ranks of our tire makers as also among the members of the Rubber Manufacturers' Association.

Black Surface Sheeting

An interesting and informative article on this subject by L. Inglis Collins appears in the pages of our contemporary *The India Rubber Journal*, July 21. He says the firms who can turn out decent black surface sheeting—even the ordinary "common-grades" kind—can be counted on the fingers. Some will be surprised at this statement, but it is probably correct, although it seems rather strange that the position today should be much as it was a quarter of a century ago. A few firms who had a name for really good work of this sort in the past still hold pride of place today, although their supremacy has been threatened by various others who can generally turn out passable if not the best work, but which are apt to fail on occasion.

The author says nothing on the score of the mixing to be used, but speaks at length on the working details, and this makes it clear that if a firm taking up the manufacture merely gets hold of the correct formula, the result is unlikely to be satisfactory unless the workmen are versed in the necessary details of working. It is urged that the milling of the rubber is a most important stage of the manufacture, whereas in some works it is looked upon as merely a haphazard job to be carried out by anybody.

The rather interesting suggestion is made that the highest quality black sheeting could be used as a substitute for the ordinary black board in the lecture room. It is to be solutioned to a slab of wood and made up in the form of a roller black board which could run from floor to ceiling. This would avoid the necessity of immediate erasion, and problems and exercises which might be useful again could be left undisturbed. It is said that the chalked figuring or writing stands out clearer than is the case with the ordinary wooden board.

The Institution of Rubber Industry

An appeal has been circulated asking for help in establishing a fund for the purpose of placing the Institution upon a firm and permanent foundation. It is pointed out that the Institution with a membership of 465 is now self-supporting, the income from subscriptions, etc., approximately meeting the current expenditure. Although a good deal has been accomplished in the way of the reading of papers by well known experts, extended activities are considered desirable, and among these are the following:

(a) The extension of lectures, etc., beyond London, Manchester, and Birmingham to other important centers in both England and Scotland.

(b) The foundation of a technical entrance examination which, working in conjunction with the Board of Education, would provide a diploma extremely useful both from the students' and the employers' point of view.

(c) The publication of a bulletin containing all papers and discussions together with other valuable information. Other industries, it is stated, have found such a bulletin of the greatest use and in view of the new developments taking place it is considered that the rubber trade would welcome a bulletin of its own.

With regard to this last point, many scientific and technical men who already subscribe to more reading matter than they have time to digest may not be altogether in agreement. And then there is, of course, the question of overlapping with existing trade journals.

The somewhat lengthy Fund Committee contains sixty-three names and the first list of subscribers published contains seventy names of individuals or firms, the amount contributed being £1236.7.6. The chief subscriber is the North British Rubber Co., Limited, with £100 plus £50 from Alexander Johnston. Similar amounts are listed from the Dunlop Rubber Co., Limited, and L. M. Bergen, but it stated that these are conditional upon the appeal receiving sufficient support. So far the diploma scheme has only been outlined, but it would seem that its success would demand more support from the manufacturing side of the industry than the institution so far has received.

Trade Notes

In connection with a certain occurrence in New York I read the other day in a newspaper that the roof of a block of flats in that city had recently been covered with a plastic slate rubber at a cost of $700. I have been wondering what this slate rubber is; the description is somewhat ambiguous. As described it may be a plastic rubber compound to take the place of slate roofing, or it may be a rubber compounded with slate, as powdered slate has been recommended as a rubber component. Probably the first surmise is correct and it would doubtless interest British readers to hear a little more about this rubber compound and the extent of its applications. We hear a good deal in England about rubber roadways, but so far no references to rubber roofs, probably because roofs on which people congregate exist on only one or two hotels.

The projected removal of the St. Helens Cable & Rubber Co., Limited, from Warrington was mentioned some time ago and in July the transfer to the new works at Slough near Windsor was effected. A new plant has been erected to be used in addition to the existing plant, which has been or is being removed from Warrington. Until the removal is completely effected the old works will be kept open. The Manchester section of the Institution of Rubber Industry will lose now its most active members, though of course the loss is only sectional as London will be the gainer.

In an action brought by the Castle Rubber Co., Limited, of Warrington, against the Radio Engineering Co., Limited, of London, for payment for a quantity of ebonite delivered, the plaintiffs won

because the goods had not been objected to on delivery as enjoined under the Sale of Goods Act. Evidence was given that the ebonite contained metallic particles which made it quite unsuitable for radio purposes. It was mentioned that the plaintiffs had sold three tons of similar quality and a witness said it would be used by makers of cheap wireless sets, mainly amateurs who took without question whatever the factors offered to them. In the case under notice the County Court judge said that the question whether the bulk corresponded with the samples was a matter for an action for damages and did not arise in the defense that day.

J. Harold Birley, of Chas. Macintosh & Co., Limited, has been elected chairman of the Educational Committee of the Manchester Corporation, succeeding Sir T. T. Shann, deceased. It is an interesting fact unmentioned by the local press in referring to the appointment, that Mr. Birley's father, the late Herbert Birley, also of Chas. Macintosh & Co., Limited, was the chairman of the School Board, which preceded the present Council schools, for many years if not the whole period of the board's existence.

The works of the Chorley Rubber Co., Limited, which, owing to voluntary liquidation, were put up for sale by auction, have been purchased as a going concern. The staff has been retained and business is being carried on as usual under Miles Bolton as manager, pending the formation of a new limited company.

It is reported that Belgrave Standard Tyres, Limited, which is located at Oldham has purchased the India cotton mills at Stockport. These mills were the property of Kershaw Lees & Co., Limited, a Manchester firm of old standing, which got into financial difficulties as did several other firms owing to the slump in the cotton trade in India and the East.

At the annual meeting of the Tyre Investment Trust, Limited, held in London on July 31, the chairman, A. L. Ormerod, referred to the fact that they had now got their own office and commented upon the greater lasting power of the tires of today compared with the case a few years ago. The recent price cutting was a serious matter but it had to be met. The Trust owned seven-twelfths of the ordinary capital of the Dunlop Tyre & Rubber Goods Co. of Canada and they were also largely interested in the Far East Co. Both works had capacity in excess of their present sales and they had not been able to contribute to the present accounts, as there was no ordinary dividend. E. B. Ryckman, vice president of the Canadian company, who happened to be in London, said they had suffered from having stocks of high priced rubber but that difficulty would soon be over. They were doing well in belting, packing, hose, etc., and had recently obtained belting contracts for four large grain elevator companies in competition with the big American rubber works. He hoped that arrangements would soon be made whereby they could sell in South Africa and elsewhere as at present they were restricted to Canadian markets. With the sum of £69,303 brought forward the total amount available was £200,490. Deducting £187,500 for dividends in the preference and preferred ordinary shares the balance carried forward is £12,990, this being subject to Corporation profit tax. During the last year the Trust made an issue of £200,000 first mortgage debenture stock.

The thirty-fifth anniversary of the granting of the Dunlop pneumatic tire patent was celebrated by an invitation to visitors from various parts of the kingdom to view the Fort Dunlop works of the Dunlop Rubber Co., Limited. A brochure, issued in connection with the visit, gave some interesting particulars of the works, which employ 10,000 hands in tire and golf ball manufacture, no other branches of rubber goods manufacture being carried on there at present. At the luncheon Sir Eric Geddes presided and said that the story of the Dunlop Rubber Co., Limited, was the story of road transport as now known. Of all the home rubber factories Birmingham, he said, held the proud place of being first in efficiency, but America was coming on, the Buffalo factory management and workers having undertaken in friendly rivalry to show Birmingham what they could do.

The Rubber Trade in Europe

By Our Regular Correspondent

France

Le Caoutchouc & La Gutta-Percha points out that if certain of the liberated regions in France are being well-treated, this is not the case at Saint-Quentin. After the signing of the armistice, the rubber manufacturing firm of G. Boinet & Cie. intended to rebuild, but owing to certain projects for laying out new roads, this was forbidden. It was not until April, 1920, that this firm was authorized to proceed with its reconstruction. Unfortunately, just about this time money became tight. At present, instead of being assisted and receiving indemnity funds recognized and due, the concern is obliged to pay out of its own pocket. After statements of expenses are submitted and after quantities of red tape have been unwound, the government reimburses the firm at its convenience—generally at the end of a year—with 10-year bonds on which the recipients lose the depreciation on exchange.

Etablissements Hutchinson reports a net profit of 11,814,024.64 francs for the past business year. The capital is 15,161,100 francs; legal reserve, 1,516,110 francs; extraordinary reserves, 6,000,000; provision against fluctuation of the rates of raw materials, 8,306,-176.37 francs; writing off factories, 6,800,000 francs; stocks, 28,-464,295.10 francs.

The Compagnie Française du Caoutchouc which acquired the assets of the Manufacture Parisienne du Caoutchouc, in liquidation, took over the exploitation of the works of the latter firm and reports a favorable balance of 587,221.02 francs. Since July, 1922, the management has devoted itself to reorganization and development of the factory and sales systems, with the result that the first quarter of 1923 showed an increase of 46 per cent in the amount of business as compared with the third quarter of 1922. For the time being tires are not being manufactured, but the management intends to devote itself to this article as soon as conclusive results regarding quality and output are obtained.

The company has 13 branches in France and Algeria and 5 branches or agencies in foreign countries, especially Belgium and England.

Germany

In view of the lack of certainty, of stability in affairs created by the exchange jumble, it is a marvel that business continues at all. The whole situation is confusing in the extreme. This doubling and trebling of capital and dividend, this raising of prices by hundreds and thousands per cent,—what is it going to lead to?

The fever of activity, of buying, selling, and manufacturing that followed every depreciation of the mark hitherto, is this time practically absent, and unemployment is daily increasing. The situation is most unhealthy, profits are not real, dividends are not what they seem, and everybody is spending as fast as possible; thrift and saving are useless. Something must be done about the matter, some stability must be introduced into the German system of business and general economics.

All this has been said for the last four years at least every time the mark experienced a sudden fall, but although much has been said about the matter, little has been done to remedy it.

The latest cure advocated for Germany's troubles is to make the gold mark the basis of calculation. Prices are to be quoted in gold marks, balance sheets drawn up on the same basis, profit, loss, dividends, all to be in terms of gold marks which are for practical purposes again to be converted into paper marks at the rates prevailing from day to day.

The system has already been adopted in various industries, and apparently it does help to simplify matters somewhat and also to throw a new light on the profit and loss side of business. Some firms have introduced a system of multiplying certain basic figures by variable amounts. Both these systems are in a way variations

of sliding scales, which were boomed some time ago as the only cure for Germany's ills.

Another suggested remedy has been borrowed from Russia. It is that credit notes should be issued which should bear a certain ratio to the gold mark and the rates of which should be daily quoted on the exchange. It is thought that these notes would help to decrease the demand for foreign bills and so bring about stability in the value of the paper mark.

Economies

While it is impossible and useless to save money, the ever-soaring prices are forcing people to make what little they have stretch as far as possible. One of the economies much practiced nowadays by people who have to travel daily is to buy bicycles and motorcycles, for at present rates for fares the price of a bicycle is saved in fares within a few months. The greater use of bicycles and motorcycles of course benefits the tire business, which is doing well in spite of the fact that a tire cost over a million marks a month ago and probably costs three or four times that amount now.

In small factories discarded fire hose has been used as belting. Used as they are, experience has shown that they give good service for three or four years and more. Sometimes the fire hose is slit open, flattened out and reinforced. These do not wear quite so well as they are likely to split along the edges and must be carefully finished.

It has been suggested that good use could be made of cast off rubberized raincoats. According to the condition of these coats, it could be possible to make air-cushions, bags for brushes, combs, and sponges, collapsible washing-basins, foot-baths, strips for hats, squares for babies' cribs, aprons for boys, and slippers for children. Attention has also been called to the fact that rubber-covered rolls are often thrown on the rubbish heap without any attempt at selling them. However, as the price for old rubber and waste is increasing, dealers in these articles will become more active and there will be less throwing away of usable scrap and old rubber.

Company News

The New York-Hamburger Gummi-Waaren-Compagnie recently celebrated its fiftieth anniversary. The firm specializes in hard rubber goods and is one of the best known in Germany. The general manager of the concern is Leopold Osbahr who has been with this enterprise for 45 years.

Austria

The Vereinigte Gummiwaaren Fabriken of Wimpassing near Vienna have put automobile tires on the Italian market. It is intended later on to add motorcycle tires.

As these tires are manufactured in Austria one might have expected that, due to the depreciated currency, prices would be below the scale dictated by Michelin to which Italian manufacturers and importers must conform. But according to the agent for the Wimpassing tires the Michelin scale has been adopted for various sizes, although a larger discount is offered to dealers, 10 per cent plus 5 per cent, as against the Michelin terms of 10 per cent.

Sweden

Official statistics of Swedish imports over 1922 show that the bulk of the articles come from Germany, England, and America. Large quantities of goods also come from Denmark, but these are probably goods in transit from Germany.

Imports of rubber thread amounted to 6,790 kilos, value 65,802 kroner; of this England supplied 5,140 kilos, value 52,112 kroner.

Packing and the like came to 84,789 kilos, value 296,762 kroner, Germany's share being 45,294 kilos, value 158,529 kroner; England's share 32,702 kilos, value 114,457 kroner, while America supplied only 1,262 kilos, value 4,417 kroner.

The total for solid tires was 251,592 kilos, value 742,207 kroner; 65,878 kilos, value 148,185 kroner, came from England; 64,945 kilos, value 261,924 kroner, from Holland; 64,209 kilos, value 194,035 kroner, from Denmark, and 32,885 kilos, value 86,120 kroner, from America. From Germany came 15,932 kilos, value 29,788 kroner.

Of hose, armored or woven rubber lined, totaling 33,626 kilos, value 82,784 kroner, Germany supplied the greater part, 23,158 kilos, value 49,642 kroner. America's share was 5,292 kilos, value 18,077 kroner. Of other hose, amounting to 59,748 kilos, value 199,043 kroner, more than half—31,220 kilos, value 79,088 kroner—came from Germany; from America came 10,732 kilos, value 40,231 kroner, and from England 9,557 kilos, value 42,181 kroner.

Most of the belting was from England, that country sending 48,377 kilos, value 338,091 kroner, out of a total 99,785 kilos, value 646,459 kroner. America was next with 21,139 kilos, value 104,483 kroner, and Norway third with 15,222 kilos, value 120,133 kroner. Footwear shipments came to 105,527 kilos, value 412,757 kroner. Over a third came from France, about one-fifth each from England and America.

The bicycle tire imports totaled 128,408 kilos, value 990,340 kroner; of this England supplied 43,747 kilos, value 334,730 kroner; Germany 28,510 kilos, value 220,837 kroner; America 12,261 kilos, value 93,591 kroner. Automobile tires constituted the biggest single item of imports and were 1,056,283 kilos, value 11,619,113 kroner. Of this America shipped just about one-half—518,179 kilos, value 5,699,969 kroner; Great Britain sent 410,740 kilos, value 4,518,140 kroner; Denmark 36,458 kilos, value 401,038 kroner; Germany 27,311 kilos, value 300,421 kroner.

Other soft rubber goods totaled 253,963 kilos, 2,031,704 kroner, the chief sources being Germany, England, America, in the order named. Germany also sent by far the greater part of the imports of hard rubber, which were 43,199 kilos, value 257,655.

Novelties in Sweden

According to local dealers more than 75 per cent of the rubber sundries and specialties used in Sweden are imported from Germany, the rest from America or England. Articles come in a wide range of prices; bathing caps, for instance, can be bought for anything between 1.50 kroner and 15 kroner ($0.42 and $4.20 respectively). The duty on certain specialties is high, particularly if they contain silk. On silk dress shields the duty per kilo comes to $2.16; on other kinds $0.61 per kilo. Clothing containing silk pays $1.62 per kilo; others, half the amount.

RUBBER PAVEMENT DEVELOPMENTS

The Board of Rubber Roadways, Limited, in issuing its annual report, states that the section of roadway in Borough High street, Southwark, England, which was laid in 1920 with the rubber cap vulcanized onto an expanded metal plate, continues to give fairly satisfactory results, although a few of the blocks came loose and had to be removed. That method of attachment, however, had the drawback that the cap had to be laid in wet concrete and the road closed to traffic until the concrete was properly set.

The experience gained on this has been most valuable and has resulted in better methods of attachment being devised. The Board was able to arrange for experiments to be carried out with two improved types of blocks, namely: (1) a vulcanized rubber cap fixed to a concrete block, the under portion of the cap being molded so as to grip the concrete base; the measurements of the complete block being 9 by 3 by 3 inches; and (2) an all-rubber block measuring 8 by 4 by 3 inches, the upper portion to the extent of half an inch consisting of rubber of the quality and resiliency which has proved successful in other tests, the remainder being composed of a hard rubber of a lower grade, the two grades of rubber being vulcanized together to form a homogeneous block.

A few of the rubber and concrete blocks were laid in Little St. Andrew street, Martin's Lane, Holborn, while small areas of the all-rubber block were also laid in the same street and in the Borough High street, Southwark.

The Rubber Trade in the Far East

By Our Regular Correspondent

Malaya

THE facts of the rubber situation at present are that prices have steadily fallen of late, although stocks in London have continued to decrease in spite of the unusually large shipments during the first six months of restriction. To some this argues that restriction was unnecessary and that the rubber market would have righted itself. However, others point out that it was not until restriction was definitely in view that prices began to go up and stocks to move, and they hold that it was the fear of having to pay famine prices for rubber as a result of restriction that led consumers, who were working on very short stocks during the slump, to buy up as much rubber as they could afford. The decrease in London stocks merely denotes that rubber is now being stored by manufacturers instead of by importers and dealers. The *Straits Times* even goes so far as to suggest that the total of stocks, visible and invisible, so far from having decreased has slightly increased, owing to heavy shipments from Malaya.

Of late shipments from Malaya have fallen, which in some quarters is regarded as a sign that the tightening-up of restriction measures is beginning to exert its influence. In January net Malayan exports amounted to 414,692 centals of 100 pounds; in March the figure was 415,254 centals, in April 417,077 centals; but in May they dropped to 338,125 centals and in June to 306,074 centals. The journal quoted, however, is not inclined to view the matter in the same light, but declares that the decreases are due to exporters holding back part of their stocks, owing to lower prices and the hope of an improvement later on in the year.

On the whole, the *Straits Times* is not at all satisfied with the provisions or the working of the restriction scheme. The figure for standard production for Malaya—270,000 tons—is too high and restriction on that basis amounts to an actual restriction of about 25 per cent only. Then there are too many leakages and abuses, including speculation and hoarding, which must be checked and real restriction enforced on a reasonable basis.

The rubber industry is not so brisk in America and since conditions in the rest of the world are not favorable American exports will suffer and manufacturers may have to slow down. So the Malayan planters may be confronted with another slump unless they make up their minds to go through with restriction in the right spirit.

Is Restriction a Failure?

This question is being freely discussed now that prices are lower and it has been shown that exports have risen. The restriction scheme overlooked many possibilities, for instance, smuggling and false statements regarding acreages and over-production due to a mistaken basis of calculation which favors old estates but is unfair to young plantations.

A planter, in a letter to a local paper, recently discussed the latter point. He says that the Duncan Standard period of 1919-20, on which old estates have their standard production based, was a period of great activity due to the high price of rubber prevailing at the time. Estates were all out to get as large crops as possible and daily and often twice daily tapping was the rule. The result was not only abnormally high crops but excessive demand for labor. When the slump came, voluntary restriction was suggested and this gave companies a chance to rest their trees and to try a new method of tapping—alternate daily and alternate period tapping—and labor was often discharged wholesale.

When compulsory restriction came into force, it was expected that labor would be freely dismissed, but, curiously enough, there is actually a shortage of labor, since most old estates are producing as much as they did in 1921 and 1922, and as far as they are concerned there is no restriction at all. To prove the above, crop records for ten Malayan estates during the first five months of 1921, 1922, and 1923, respectively, are given, the totals for the ten concerns being 3,588,005 pounds, 3,937,759 pounds, and 4,070,598 pounds for the given periods of 1921, 1922 and 1923, respectively. It will be seen that the output in 1923 is slightly over that of 1922 and 1921. In support of the statement that 1919-20 was a period of abnormal activity, are the figures for the first five months of 1919, showing 4,330,379 pounds, and for 1920, showing 5,085,909 pounds. The decrease in 1923 compared with 1920 is slightly under 25 per cent.

Considering all this, the planter is led to the conclusion that under the present calculation of standard production, compulsory restriction is an absolute failure and that the price of rubber may again fall to a very low level. If this occurs those who have opposed restriction measures and the artificial raising of prices will feel that their predictions of disaster are justified.

There is another factor which merits consideration in discussing the surprisingly high output of Malaya despite restriction, and it is this: During the slump period many estates stopped operations altogether as with their low yields—either because they were still very young or because they were situated unfavorably—it did not pay them to tap, but improved prices now make it profitable to do so. Again there must be quite a fair acreage of young rubber that has just come into bearing and their yields go to increase the totals still further.

Rubber Exports

Exports of rubber from Malaya during June, 1923, totaled 417,124 centals of 100 pounds against 439,419 centals in 1922. The foreign rubber included in the above figures amounted to 111,050 centals for June, 1923, and 51,231 centals for June, 1922. The total exports for the first half of 1923 were 2,893,418 centals against 2,623,157 centals in the corresponding period of the preceding year. The foreign rubber included in the above amounted to 647,851 centals for the six months of 1923 and 288,457 centals for the first half of 1922. Most of the foreign rubber comes from the Netherlands East Indies and is native rubber. It is held that the heavy increases in amounts received from these ports since the introduction of restriction cannot all be accounted for by increased production in the Dutch colonies, or even by release of stocks held there, and it is suspected that much of this rubber is smuggled out of Malaya and brought back again.

Bud Grafting and Seed Selection

The Federated Malay States Government has appointed a committee to report on certain proposals for the formation of a co-operative society of rubber growers to undertake seed selection and vegetative propagation of *Hevea Brasiliensis*. The *Malayan Tire and Rubber Journal*, commenting on this action of the government, calls to mind that years ago the Netherlands East Indian Government sent Dr. P. J. S. Cramer, of Buitenzorg, to study the rubber tree in Brazil and when he returned he stated that in his opinion the rubber seeds brought from Brazil by Sir Henry Wickham did not come from the region where the best Brazilian fine hard Pará was exported.

Latex Shipments

During May, 1923, Malaya exported 4,419 gallons of rubber latex, valued at $7,784; over the five months ended May, 1923, the amounts were 54,680 gallons, value $88,325.

Netherlands East Indies

The importance of the East Coast of Sumatra as a rubber producing district has grown to such an extent that it is well worth while to consider it in detail. On this coast, the planting industry occupies a practically uninterrupted territory about 100 miles long and approximately 90 miles wide. The rubber area amounts to 163,627 hectares, of which 108,677 hectares are in bearing, producing in 1922 38,400 tons of rubber and 983 tons of latex (shipped in this condition, too). Exports, however, amounted to 41,535 tons of rubber and the above quantity of latex. The difference in the export and production figures may be accounted for by native shipments, which have greatly increased since the improvement in prices for rubber.

When it is considered that up to the present only 66.42 per cent of the planted area is in bearing, then it immediately becomes evident that a considerable increase in crops may be expected in the next four years. Unless restriction should after all be introduced, the yields for the coming years may be estimated as follows: In 1923, 50,000 tons; 1924, 54,000 tons; 1925, 58,000 tons; 1926, 61,000 tons; 1927, 62,000 tons; 1928, 70,000 tons. That is to say, in five years' time the 1922 output may be practically doubled.

That restriction is carried out on the East Coast of Sumatra, too, seems to be proved by the fact that actual yields are 15 per cent below those estimated. This decrease, however, was almost entirely due to restriction by the English firms, which are said to have cut production to 60 per cent of the normal output. Incidentally, this shows what an important part British interests play here. As a matter of fact, one-third of the productive area is in their hands.

The exports of rubber from East Coast of Sumatra for the most part—67.64 per cent—go to America. To this must be added a certain percentage of the rubber shipped to Singapore.

The chief port for shipping rubber in this territory is Belawan; approximately 75 per cent of the total rubber exports go out from this port. The rest goes from Tandjong Balei and Laboean Bilik, which are the natural harbors for their districts.

Gutta Percha Planting in Sumatra

In the *Nederlandsch-Indisch Rubber en Thee Tijdschrift* of June 15, J. A. Lörzing, of the Government Botanical Gardens at Sibolanget, describes an excursion to the gutta percha district in the upper Bila Plateau. This plateau is far in the interior of East Coast of Sumatra. In this out of the way territory A. F. Bruinier opened up an estate for gutta percha over a year ago.

The best gutta percha yielding trees grow in abundance on parts of the Bila Plateau under favorable conditions and the gutta content is good. Some samples of leaves were sent to the Experiment Station of the A. V. R. O. S. (East Coast Sumatra Rubber Planters' Association) and the analysis showed that the yield is superior to anything obtained elsewhere. There are four important varieties growing here, named, in the order of their economic value: 1, *Palaquium oblongifolium Burck;* 2, *P. Gutta Burck;* 3, *P. borneense Burck*, and 4, *Payena Leerii Kurz.* Ranked according to the number of trees, the order is 2, 3, 1, and 4.

Years ago, the natives started felling the trees to collect the gutta percha. As the trees became scarcer, they worked more economically and began to lay out primitive cultures together with Hevea. Thanks to this there are in the hills above Aekboero (the estate opened by Mr. Bruinier) about 1,200 seed trees, which have been rented to the owner of the estate for a term of 5 years.

The concession Aekboero covers an area of 2,213 hectares, all of which is arable. There are about 70,000 trees of the four varieties named. The trees bear seed when they are from 4 to 6 years old and grow best in the forest. In his methods of planting, Mr. Bruinier follows an improved method of the natives. The young plantations seem to benefit by the simple and cheap method of cultivation and were entirely free from pests and diseases. In the nursery there are some 100,000 seedlings, chiefly *Palaquium oblongifolium.*

In the exploitation of Palaquium, only the leaves are harvested. Trees of this variety yield a good product as early as 3-5 years, analyses showing a gutta content of 5.6 to 9.2 per cent. The fresh leaves are chopped up, then finely ground between millstones. This mass is transferred to a kettle with rotary arrangement where it is stirred constantly while water is added and slowly heated to 70 degrees C. The warm mass is brought to another kettle with cold water; constant stirring is kept up and the gutta percha comes to the top. This is removed, cleaned in a universal washing apparatus and then pressed into blocks.

Bud-Grafting

At a meeting of the Rubber Planters' Association, Bandoeng, Dr. Steinmann lectured on bud-grafting. The budded trees on the estate Pasir Waringin have now been tapped for a year, but since the tapping method had to be changed a few times, it is difficult to come to any definite conclusion regarding the progress of the trees. A comparison of tapping records for different trees shows that the relation of the production of the budded trees has not remained constant.

For practical purposes, the most important question is, however, what the ratio of the yields from budded trees is as compared with the yields of equally old seedlings. Dr. Bally said in the *Rubber Archief*, January 1, 1923, that trees from seed from selected mother trees in the case of Pasir Waringin average a slightly higher yield than the budded trees. On the estate Bodjong Datar buddings and seedlings of the same age were experimented with. The budded gardens of the best type averaged 9 grams of dry rubber per tree per tapping; the average over 10 budded gardens was 6½ grams dry rubber. After making allowances for errors, it was found that the yield per tree of the budded trees was practically the same as that for trees from selected seed. However, since there are many more seed trees per bouw, the yield per bouw of these is considerably higher than the yield per bouw from budded trees.

Consequently, the conclusion for the time being is that very probably the difficult and expensive work of budding trees will not pay, at least as far as tapping-acreages are concerned.

Exports

The total exports of rubber from the Netherlands East Indies during the first quarter of 1923 were around 32,000 tons against 20,500 tons for the same period of 1922.

The details of these figures are as follows: Java and Madura, 8,562 tons against 6,981 tons in 1922; East Coast Sumatra, 11,855 tons and 9,496 tons respectively; Djambi, 3,826 and 1,584 tons; Bandjermassin, 3,061 against 324 tons; Sambas, 637 tons against 298 tons; Biouw and dependencies, 1,135 tons instead of 738 tons; Sibolga, 631 tons instead of 422 tons; Pontianak, 890 tons and 285 tons; Palembang, 968 tons against 47 tons; other parts, 435 tons against 325 tons. Altogether there was an increase of 11,500 tons over the figures for 1922, or more than 50 per cent. Of the 1923 exports 21,385 tons came from estates and the rest, or one-third of the whole amount, was native rubber.

If the exports continue at the same rate for the year, the total shipments during 1923 will run up to 128,000 tons, of which some 40,000 tons will be native rubber. However, it should be remembered that native exports are strongly influenced by the fluctuations in prices. It must also be taken into consideration that native exports probably include old stocks.

Exports of gutta jelutong from the Dutch colonies amounted to 2,156,535 kilos during 1922. Of this amount the Western Division of Borneo delivered 122,396 kilos; the Southern and Eastern Divisions of Borneo, 1,834,457 kilos; Palembang, 186,122 kilos; Djambi, 13,120 kilos; Lampong districts, 440 kilos. The last three districts are in Sumatra.

Native Rubber Estates of Sumatra[1]

Fifty Million Native Owned Trees—Possible Production of 80,000 Tons Annually

THE native rubber culture in Sumatra is chiefly centered in Palembang, Djambi, and Benkalis. There is also some planting in Tapanoeli and Indragiri. It is estimated that the number of trees possessed by the natives is about 50,000,000 in all. In Benkalis alone there are said to be over 20,000,000 trees. In the hands of Europeans the production of 50,000,000 trees would be about 80,000 tons of rubber per annum, an amount that would have a deciding influence on the market price. At present, however, these yields are not obtained.

The native industry along the Kaeanta river (Indragiri) between Rengat and Taloek has a lower standard of cultivation than in Tapanoeli. Taloek is the chief center of the Kaeantan valley and the rubber gardens are generally small, containing 200 to 600 trees, often planted very close together. However, there are exceptions; thus, one man has 35,000 trees planted at distances of 24 by 24 feet. Close planting is more economical as far as upkeep is concerned.

Where the owner himself does the tapping, this operation is carefully carried out and some gardens compare very favorably with good European estates in this respect. Where, however, tappers are employed, things are different. As tappers receive half of what they bring in, which is sold to the owner, they naturally secure as much latex as possible and do not spare the trees. The method of preparation is the most primitive and the thick sheets obtained resemble slab rubber. These are sold to a Chinese dealer.

In December, 1922, the price for this rubber at Rengat—the port for Taloek rubber which goes to Singapore—was about 40 gilders a picul. A gilder equals 0.40; a picul equals 133⅓ pounds. As soon as the price is over 20 gilders a picul, tapping is profitable. According to figures given by the customs at Rengat, very little rubber was exported from here during the first half of 1922; on the other hand, during November, 1922, the district shipped 340 metric tons of rubber.

In parts of Tapanoeli, many estates are very well laid out and taken care of. One old *hadji* possesses about 200,000 trees and has invested something like 200,000 gilders in his venture.

The method of garden up-keep is interesting. The gardens are kept clear of shrubs, and grass is allowed to grow, which is kept short by letting the cows graze there. The cows have made horizontal paths over the land which is rather hilly and thus the owner has obtained cheap and practical terraces which prevent soil erosion.

Because the planting and harvesting of rice interferes, the gardens are tapped only 7 months of the year, divided into two periods of 3 to 4 months. Thus necessity early introduced a system here that has just been heralded as the system of the future by European planters.

The *hadji* in question demands a fairly good product from his employes and as he also buys rubber from smaller holdings near him and this must also conform to his standard, fairly good smoked sheets are produced in the vicinity.

The price that the *hadji* pays his tappers for their half of the rubber is much lower than the market price, so that the total cost price of a kilo of rubber comes to about 0.20 to 0.25 gilders. His tappers tap about 400 to 500 trees each and their share amounts to 0.50 gilders a day. In poor times they get somewhat less, and when prices are very good the *hadji* gives them a fixed daily wage without any share in the rubber crop.

From what he has seen, Dr. Vischer concludes that with an intelligent population like that in the last-considered district, native cultivation may reach a level—which it has already partly attained—where it could compete with European rubber production with much chance of success. Even in the less progressive districts the results obtained by greater care in planting, tapping, and preparation will not fail to make an impression and so raise the general standard of cultivation and manufacture.

Finally, says the writer, in times when attempts are made to raise the price of rubber artificially, the natives can throw an enormous quantity of rubber on the market, a fact which must always be taken into account. Therefore, a European company must on the one hand carefully study statistical data regarding the extent and yield of native estates, and on the other must always take care to maintain a permanent superiority by improved methods of cultivation and preparation.

Several samples of rubber from these districts were tested by Dr. O. de Vries, who declared that while some were poor and would have to be reworked, others could be sold on the market and obtain fair prices as off-quality smoked sheet. This latter was a product that could be well used for ordinary rubber manufactures where a high grade raw material was not necessary.

Archief voor de Rubber Cultuur

(1) Native Rubber Estate in Sumatra. (2) Coagulating the Latex. (3) Hand Mangle for Sheeting the Coagulated Rubber

[1]Dr. W. Vischer in the *Archief voor de Rubber-cultuur*, June, 1923.

Recent Patents Relating to Rubber

The United States

Issued* July 3, 1923

NO. 1,460,421 Abdominal support. M. A. Keeler, San Francisco, Calif.
1,460,430 Life belt. F. Morse, New Haven, Conn.
1,460,453 Cushion wheel. M. J. Stein, Chicago, Ill.
1,460,533 Compression tube. G. R. Colby, Portland, Oregon.
1,460,588 Cushion tire. E. A. Johnson, Brooklyn, N. Y.
1,460,599 Reenforced tire casing. H. Nicholson, Chicago, Ill.
1,460,659 Boot and liner for casings. J. L. D. Blevans, Dallas, Texas.
1,460,753 Concealed tire valve. P. J. Griffin, Dorchester, Mass.
1,460,775 Two-part tube with individual valves. W. A. Walsh, Avoca, Pa.
1,460,781 Pneumatic tire protector. C. W. Bain, Indianapolis, Ind.
1,460,794 Tube casing. J. H. Grube, Los Angeles, Calif., assignor to Grube Auto & Tire Specialties Corp., Phoenix, Arizona.
1,460,804 Valve stem for tires. A. B. Shaw, Medford, assignor to Shaw Specialty Co., Inc., Boston, both in Massachusetts.
1,460,927 Vacuum cup. R. S. Thompson and C. F. Doscher—both of New York, N. Y.

Issued* July 10, 1923

1,461,166 Cushioned hub. C. E. Soper, Elmira, N. Y.
1,461,193 Pneumatic toy. H. Larsen, Racine, Wisconsin.
1,461,194 Split-rim tool. A. L. Levy, Youngstown, Ohio.
1,461,217 Puncture-proof reliner. D. L. Lazerick, Cleveland, Ohio.
1,461,311 Demountable rim. L. B. Hancock, Richmond, Virginia.
1,461,442 Garment hanger with an elastic sleeve. I. Duberstein, Los Angeles, Calif.
1,461,485 Single-tube pneumatic tire. W. H. Kern, Jersey City, N. J.
1,461,505 Resilient rim and tire wheels. F. Thornton, Huntington, W. Va.
1,461,527 Rubber apron for carding machines. T. H. Hunter and G. W. Hunter, Philadelphia, Pa.
1,461,533 Hair curler. O. D. McClintock, San Francisco, Calif.

Issued* July 17, 1923

1,461,766 Cushion tire. A. J. Wiegand, Baltimore, Md.
1,461,911 Pneumatic swimming support. G. Jordahn, Palm Beach, Fla.
1,461,928 Cushion tire. F. C. Miller, Chicago, Ill.
1,461,986 Cushion tire. C. Schneider, Hackett, Ark.
1,462,021 Dust cap. E. V. Myers, East Orange, N. J., assignor to A. Schrader's Son, Inc., Brooklyn, N. Y.
1,462,117 Tire and rim construction. C. N. McClintock, Elwood, Ind.
1,462,227 Tire valve. W. E. Copithorn, Natick, Mass.
1,462,279 Elastic fabric. V. Guinzburg, New York, N. Y., assignor to I. B. Kleinert Rubber Co., New York, N. Y.
1,462,391 Brake block. R. J. Stokes, assignor to Thermoid Rubber Co., both of Trenton, N. J.
1,462,394 Dust cap. G. W. Terry, Nashville, Tenn.
1,462,423 Corset with elastic sections. P. H. Robbins, assignor to Poirette Corsets, Inc.—both of New York, N. Y.
1,462,440 Spring cushion tire. A. E. Bauman, Akron, Ohio.
1,462,453 Tire construction. W. G. Lerch, Akron, Ohio, assignor to The India Tire & Rubber Co., Mogadore, Ohio.
1,462,469 Screening device. B. B. Carlton and C. J. Burkley, assignors to The Goodyear Tire & Rubber Co.—all of Akron, Ohio.

Issued* July 24, 1923

1,462,517 Tire bead and method of manufacture. M. A. Marquette, assignor to the Fisk Rubber Co.—both of Chicopee Falls, Mass.
1,462,628 Blow-out patch for tires and tubes. A. S. Thoresen and F. E. Benoit—both of North Attleboro, Mass.
1,462,760 Cushion tire. F. A. Krusemark, assignor to K. F. & C. Tire & Rubber Corporation—both of Roanoke, Va.
1,462,769 Collapsible boat. A. V. Santarsiero, New York, N. Y.
1,462,837 Tire filler. S. Vitaliano, Hazleton, Pa.
1,462,942 Sectional inner tube. J. A. Rogers, New York, N. Y.
1,462,984 Tire casing. F. G. Schenuit, Baltimore, Md.

The Dominion of Canada

Granted July 3, 1923

232,313 Bathing cap. A. Baldwin, N. S. Pittsburgh, Pa.
232,348 Inner tube. B. G. Goble, Tulsa, Oklahoma.
232,349 Inner tube. B. G. Goble, Tulsa, Oklahoma.
232,350 Inner tube. B. G. Goble, Tulsa, Oklahoma.
232,385 Self-sealing tube. J. Schwab, Winnipeg, Manitoba, Canada.
232,387 Sectional tire tread. A. Silvene, Victoria, British Columbia, Canada.
232,395 Armored tire and wheel. W. G. Wilson, Bridgeport, Conn.
232,459 Brake lining. The Thermoid Rubber Co., Hamilton Township, assignee of W. Dolton Pardee, Trenton, both in New Jersey.

Granted July 10, 1923

232,526 Tire valve dust cap. N. Boivin, Donnacona, Quebec, Canada.
232,554 Life preserver. L. J. O'Shaughnessy, Halifax, Nova Scotia, Canada.
232,593 Bicycle pedal and treads. The Canada Cycle and Motor Co., Ltd., Weston, assignee of H. W. Peace, Toronto—both in Ontario, Canada.
232,603 Rubber cover for steering wheels. The Lion-Mead Rubber Co., Toronto, Ontario, Canada, assignee of W. F. Ridge, Akron, Ohio.

Granted July 17, 1923

232,699 Pneumatic swimming support. G. Jordahn, Palm Beach, Fla.
232,702 Massage brush. F. L. Mathieu, South Bend, Ind.
232,713 Demountable rim. A. Persson, Calgary, Alberta, Canada.

Granted July 24, 1923

232,828 Tire tread shoe. A. M. Beuhler, Waterloo, Ontario, Canada.
232,909 Rubber hose. E. Schulthess, South Orange, N. J.
232,998 Puncture-proof inner tube. E. W. Thurlow, Middle Brighton, assignee of W. K. Hughes, Melbourne, assignee of one-half of the interest—both in Victoria, Australia.

The United Kingdom

Published June 27, 1923

196,950 Rubber in road-dressing materials. J. A. Vielle, 17 Waterloo Place, London, England.
196,959 Hot water bottle. Plantation Rubber Manufacturing Co., Ltd., and M. M. Dessau, 14 Mincing Lane, London, England.
196,960 Sheet rubber tap and hose pipe attachment. Plantation Rubber Manufacturing Co., Ltd., S. E. Snell and M. M. Dessau, 14 Mincing Lane, London, England.
196,981 Container with rubber packing. A. W. Minto, Vermont Villa, Vermont Road, Rusthall, Tunbridge Wells, Kent, England.
197,016 Rubber paving blocks. Plantation Rubber Manufacturing Co., Ltd., and M. M. Dessau, 14 Mincing Lane, London, England.
197,025 Non-refillable bottle stopper with rubber washer. R. H. Roberts, 45 Great Charles street, Birmingham, England.
197,161 Rubber washing-plungers. W. H. Merifield, Redcroft, Chester Road, Erdington, Birmingham, England.
197,231 Rubber horseshoe pad. J. Wilkinson, 1 Henry street, Sheffield, England.
197,244 Collapsible rim. G. S. Webb, 546 Pearl street, Aurora, Illinois, U. S. A.
197,245 Flanged rim. G. S. Webb, 546 Pearl street, Aurora, Illinois, U. S. A.
197,261 Self-sealing inner tube. H. Nicolardot, 57 Rue des Tilleuls, Boulogne-sur-Seine, Seine, France.
197,268 Cushion tire. L. O. Mitchell, 2106 East 42nd street, Kansas, Missouri, U. S. A.
197,278 Elastic lacing for shoes. J. Faulkner, The Orchard, Condamine street, Manly, Sydney, Australia.

Published July 4, 1923

197,346 Rubber tire. Plantation Rubber Manufacturing Co., Ltd., W. Luffsmith and M. M. Dessau, 14 Mincing Lane, London, England.
197,363 Mudguard. J. Pollock, 63 Dunn street, and C. Greaves, 7 Shumac street—both in Newcastle-on-Tyne, England.
197,390 Rubber-studded horseshoes. W. H. Giles, 2 Rangemore street, Burton-on-Trent, England.
197,524 Armlet purse for bathers. W. B. Marsh, 415 East 23rd street, Brooklyn, N. Y., U. S. A.
197,544 Display stand with sponge rubber cushion. Stratton & Co., Ltd., and G. A. Laughton, Bromsgrove street, Birmingham, England.
197,559 Rubber darning egg. C. T. B. Sangster, Heathercroft, St. Agnes Road, Moseley, Birmingham, England.
197,591 Tire valve, Michelin et Cie., Clermont Ferrand, France.
197,612 Toy projector for darts. M. Stoddard, Sandbank Cottage, Woodlands street, Milngavie, near Glasgow, Scotland.

Published July 11, 1923

197,698 Tapping tool. J. Bosch, 10 Sneeuwbalstraat, The Hague, Holland.
197,704 Tire casing. A. E. Wite, 88 Chancery Lane, London, England.
197,705 Rubber handle-grips. Plantation Rubber Manufacturing Co., Ltd., G. F. Underwood and W. Luffsmith, 14 Mincing Lane, London, England.
197,741 Self-sealing tube. E. W. Thurlow, 28 Normanby street, Middle Brighton, and W. K. Hughes, 22 Collins street, Melbourne—both of Victoria, Australia.
197,761 Rubber handles for bats, hockey sticks, etc. W. B. Cochrane, 23 Bourne street, West Croydon, Surrey, and J. S. Simpson, 107 Borough High street, London, England.
197,767 Rubber-cased clamps for table tennis, posts, etc. J. Honey, 39 High street, Penge, London, England.
197,787 Tire valve. A. Schrader's Son, Inc., 783 Atlantic avenue, Brooklyn, N. Y.
197,879 Rubber impregnated sheets of carded cotton. J. W. Shaw, Nevill, Bramhall Lane, Stockport, Cheshire, England.
197,921 Tire bead. C. L. Baudry De Saunier, 108 Rue Lauriston, Paris, France.

*Under Rule No. 167 of the United States Patent Office, the issue closes weekly on Thursday, and the patents of that issue bear date as of the fourth Tuesday thereafter.

Chemical Patents will be found on Page 783, Machinery and Process Patents on pages 787-788.

Published July 18, 1923

197,953 Pneumatic tire rim. C. L. Baudry De Saunier, 108 Rue Lauriston, Paris, France.

197,960 Football. G. Venosta, 29 Via Scarlatti, Milan, Italy.

197,976 Non-slipping pads for mats and rugs. Plantation Rubber Manufacturing Co., Ltd., and M. M. Dessau, 14 Mincing Lane, London, England.

198,066 Rubber blocks for roads, floors, etc. Dunlop Rubber Co., Ltd., 1 Albany street, Regent's Park, London, and W. H. Paull, Aston Cross, Birmingham, England.

198,151 Armored tire. J. M. Margarinos and F. Orive, 671 Maipu, Buenos Aires, Argentina, South America.

New Zealand

Published May 31, 1923

49,640 Pneumatic tire. McLeroth Pneumatic Tyre Syndicate, Ltd., Pinners Hill, Austin Friars, London, E. C. 1, England, assignee of Thomas Baker McLeroth, 56 Harley House, Regent's Park, London, N. W. 1, England.

Published June 14, 1923

48,250 Footwear with raw crêpe rubber soles. F. McLeod, 362a Pitt street, Sydney, New South Wales, Australia.

Germany

Patents Issued, with Dates of Issue

380,667 (June 4, 1921). Rubber tread with inserts of linen and rope. Adolphe Kégresse, Paris; represented by: E. Peitz and W. Massohn, Berlin, S. W. 68.

380,802 (December 31, 1922). Cushion tire. Ernest Ackermann, Basel, Switzerland; represented by: G. Hirschfeld, Berlin, S. W. 68.

380,944 (May 10, 1922.) Occlusive pessary. Dr. Julius Frankenstein, Kaiser-Wilhelmstrasse 5, Berlin-Schöneberg.

380,945 (May 30, 1922). Atomizer. Alfred Stumpf, Grosse Fleischergasse 14, Leipzig.

Germany

Design Patents Issued, with Dates of Issue

847,412 (February 15, 1923). Table-cloth protector. Gummiwarenfabrik M. Steinberg.

847,413 (February 16, 1923). Rubber glove. Gummiwarenfabrik M. Steinberg, Köln-Lindenthal.

847,414 (February 19, 1923). Rubber pouch for packing seamless goods. Gummiwarenfabrik M. Steinberg, Köln-Lindenthal.

847,469 (April 16, 1923). Insulating mattress. Asbest-und-Gummiwerke Alfred Calmon A.-G., Hamburg.

847,522 (April 17, 1923). Rubber heel with removable steel inlay. A.-G. Metzeler & Co., Gummiwarenfabrik, Munich.

847,590 (May 11, 1923). Sport belt of sheet rubber. Gummiwarenfabrik Max Steinberg, Köln-Lindenthal.

847,656 (December 3, 1921). Rubber patches and heels for those who wear down their heels unevenly. Heinrich Dresing, Bad Oeynhausen.

847,690 (May 7, 1923). Wall protector of rubber or rubber in combination with fabrics. Gummiwarenfabrik M. Steinberg, Köln-Lindenthal.

847,811 (May 14, 1923). Rubber shoe nail. Carl Blum, Karlstrasse 17, Kaiserslautern.

848,088 (April 26, 1923.) Heel for footwear. Detlef Lassen, Harrisleerstrasse 38, Flensburg.

848,184 (April 11, 1922). Heel. Heinrich Dresing, Hansastrasse 12, Dartmund.

848,220 (May 15, 1923). Heel with tin insert. Karl Nagel, Rosskampfstrasse 10, Heilbronn a. N.

848,301 (June 29, 1920). Concave rubber sole with two rubber layers held together by means of a strong, rubberized insert. Sam Baron, Hannoversche Gummiwarenfabrik, Hannover-Hainholz.

848,491 (May 22, 1923). Rubber stamp. Karl Johannes Müller, Tempelhofer Ufer 12, Berlin.

848,715 (March 31, 1923). Mudguard. C. Müller Gummiwarenfabrik A.-G., Berlin-Weissensee.

848,765 (February 9, 1922). Bathing cap. Michael Hahn, Neuhauserstrasse 12, Munich.

848,802 (May 22, 1923). Heatable irrigator. David Holzkämper, Eichendorffstrasse 39, Köln-Ehrenfeld.

849,252 (February 19, 1923). Suctional inner tube. Willy Kauba and R. Peschek, Aussig-Prödlitz, Czecho-Slovakia; represented by: Kappert, Graf Adolfstrasse 46, Düsseldorf.

849,283 (May 30, 1923). Insert of rubber for heels. Leo Salge, Humboldtstrasse 7, Braunschweig.

849,470 (June 6, 1923). Bandage for varicose veins. Helene Wiesner, Eberswalderstrasse 35, Berlin.

849,527 (May 31, 1923.) Sole. Walther Hilsberg, Bad Schwartau.

849,558 (June 8, 1923). Rubber heel. Eli Wertheim, The Hague, Holland; represented by: Paul Brögelmann, Berlin-Halensee.

849,581 (May 12, 1923). Shoe lace. Bruno Meyer, Blankenburg a. H.

849,584 (May 16, 1923.) Shoe lace. Bruno Meyer, Blankenburg a. H.

849,650 (May 28, 1923). Tire cover with non-skid arrangement consisting of calk-shaped projections. Siegmund Levin, Kurfürstendamm 58, Berlin.

Italy

Patents Issued, with Dates of Issue

546-108 (October 5, 1922). Dough for making toys, dolls and similar articles. Gaspare Burgarella, Rome.

Trade Marks

The United States

Two Kinds of Trade Marks Now Being Registered

Under the rules of the United States Patent Office, trade marks registered under the Act of February 20, 1905, are, in general, fanciful and arbitrary marks, while those registered under the Act of March 19, 1920, Section 1 (b), are non-technical, that is, marks consisting of descriptive or geographical matter or mere surnames. To be registered under the latter act, trade marks must have have been used for not less than one year. Marks registered under this act are being published for the first time when registered, any opposition taking the form of an application for cancellation.

Granted July 3, 1923, Act of February 20, 1905

169,846 Portrait of Martha Washington, and above this the name MARTHA WASHINGTON—jar rubbers. Joannes Bros. Co., Green Bay, Wisconsin.

169,849 TAXICORD—pneumatic tire casings made of rubber combined with fabric. The B. F. Goodrich Co., New York, N. Y.

169,865 GOTHAM—pneumatic tires and inner tubes. Globe Rubber Tire Manufacturing Co., Trenton, N. J.

169,890 The outline of a dress shield, with the word EMPIRE at the center—dress shields. Empire Shield Co., New York, N. Y.

Granted July 3, 1923, Act of March 19, 1920, Section 1 (b)

169,925 The words: THE TIGHT LINE, the top stroke of the first and of the final T in the word TIGHT being connected in such a way as to form a straight line over the other letters and the words MAKE and STAY, respectively, arranged above and below the word TIGHT in such a way as to suggest the circumference of a circle; the words THE and LINE underscored—rubber compression and self-closing cushions, washers, packings, rubber Fuller balls, gaskets, plunger rings, elbows, tubing, etc. J. A. Sexauer Mfg. Co., Inc., New York, N. Y.

169,937 SANBORN'S; the first and final S being display capitals—garments, including raincoats of rubberized material. Sanborn Weatherwear Coat Co., Inc., New York, N. Y.

Granted July 10, 1923, Act of February 20, 1905

169,948 SUG-OOTER—swimming belts. Gus Jordahn, Palm Beach, Florida.

169,997 Representation of a globe surrounded by a belt, bearing the word: GLOBESTOS—brake linings. United & Globe Rubber Co., Trenton, N. J.

170,005 NORTH-POLE—composition soles for footwear. Assin Konoff, Toledo, Ohio.

170,046 LASTIKON—rubber composition floor covering. The Hupp Products Co., Columbus, Ohio.

170,062 XX—brake lining. Johns Manville, Inc., New York, N. Y.

170,079 NON FLI—dry color for use in rubber manufacture. The Ault & Wiborg Co., Cincinnati, Ohio.

170,087 The words: WISCONSIN RUBBER MILLS CO., LACROSSE, WISCONSIN, U. S. A. within a border suggesting a label, with extensions at the side for attaching—LaCrosse Rubber Mills Co., doing business as Wisconsin Rubber Mills Co., LaCrosse, Wisconsin.

170,091 HOSE-UPS—hosiery supporters. The Komdo Novelty Co., Mount Vernon, New York.

170,094 On a diamond shaped background the word HI-WAY—self-vulcanizing tire patch. Lawrence A. Finstick, doing business as Hi-Way Laboratories, La Porte, Indiana.

170,095 THOM MCAN—shoes of combinations of leather and rubber and of rubber and fabric. Melville Shoe Corp., New York, N. Y.

170,096 The letters TP in fanciful arrangement—rubber heels. Tee Pee Rubber Co., Inc., New York, N. Y.

170,115 The letter A against a background suggesting two circles of rubber tubing, one within the other—rubber heels. Armstrong Cork Co., Pittsburgh and Lancaster, Pennsylvania.

170,117 PERSONALITY CLOTHES—outer garments, including raincoats. Shirek & Hirsch, New York, N. Y.

170,129 Representation of a tropical landscape with palm trees on bank of a river, the word A..AZON on the part designating the river—rubber jar rings. Cupples Co., Manufacturers, St. Louis, Missouri.

170,207 On a representation of a shield, at top the word NORGLID, and on either side the word MERIT: at center the fantastic arrangement of three legs running in a circle simulating spokes of a wheel—pneumatic and solid rubber tires, tubes, patches, outside tire sleeves, inside tire sleeves, rubber hose, portable vulcanizing outfits, and rubber gaskets. Stanley Glidden Co., Inc., Boston, Mass.

170,244 Representation of an eagle, wings extended, standing on a slotted block partly surrounding which is a wreath; in the background a representation of the sun, and at the sides the monogram HR at left and & Co at right—rubber tissue for reinforcing, stiffening and waterproofing. Edward P. Stahel & Co., New York, N. Y., assignors to H. Rost & Co., Hamburg, Germany.

170,255 Within a square black border the letter V, and inclosed within the triangular space the words: Voorhees Rubber M'f'g Co—hose, belting and packing made wholly or partly of rubber or of rubber composition. Voorhees Rubber Manufacturing Co., Jersey City, N. J.

170,301 TUBETITE—compound for preventing punctures in pneumatic tires, C. V. Crumley, doing business as Tubetite Manufacturing Co., Tacoma, Washington.

170,311 ALENCO—cotton fire hose. Wm. & Chas. Bech, Inc., Lawrence, Massachusetts.

Granted July 10, 1923, Act of March 19, 1920, Section 1 (b)

170,312 ARIMEX—belting made of rubber and fabric. New York Belting & Packing Co., New York, N. Y.

170,313 INSPIRATION—belting made of rubber and fabric. New York Belting & Packing Co., New York, N. Y.

170,358 SHOOR-PATCH, in white letters crossing diagonally a black square background from which the corners have been eliminated—a preparation of pure rubber in plastic form for repairing tires, tubes, and other rubber goods. Joseph J. McBride, doing business as the Shoor-Patch Rubber Co., Philadelphia, Pa.

Granted July 17, 1923, Act of February 20, 1905

170,399 Monogram AS on black oval background; beneath this the words: "OSTEO-PATH-IK"—shoes, inner and outer soles made of leather, fabric, rubber, and combinations of same. Allen-Spiegel Shoe Manufacturing Co., Belgium, Wisconsin.

170,435 A fanciful picture simulating a photograph of a man in an oval frame, at the bottom of which is the name: THOM MCAN—shoes of combination of leather and rubber and rubber and fabric. Melville Shoe Corporation, New York, N. Y.

170,487 GEM, the letters graduated in size to form an isosceles triangle, the apex being on the left at G—tires and inner tubes of rubber compound. Leo L. Chadwin, doing business as Gem Tire & Rubber Co., Philadelphia, Pennsylvania.

170,492 Radio Aerial with wires stretched from pole to pole, and zigzag lines indicating electric current, while across wires and lines the words THE RADIO BALL extend—inflated toy rubber balls. Radio Ball Co., Lebanon, Pennsylvania.

170,546 PREMIER, on an eight-sided double-ruled background, a double ruled triangular section being outlined immediately above and below the word—rubber tires. The Fisk Rubber Co., Chicopee Falls, Massachusetts.

170,568 VENTO—baby pants or diaper cover. Sol H. Shoninger, doing business as the Solvos Co., Chicago, Illinois.

170,588 ROADSTER—vehicle tires of rubber and rubber and fabric, inner tubes, tire casings and shoes and repair parts to be used in connection with same. The Ideal Tire & Rubber Co., Cleveland, Ohio.

170,593 SPENWOOD—rubber tires and inner tubes. George Spencer, Moulton & Co., Westminster, London, England.

170,600 Representation of the globe showing the western hemisphere, with the words WICHITA, KANSAS extending across the United States, and two tires encircling the globe longitudinally—rubber tires and tubes. The Mid-Continent Tire Manufacturing Co., Wichita, Kansas.

170,601 On a black rectangular placard the words: QUALITY-STRENGTH; beneath this in elaborate script: TOURISTS PRIDE; beneath this the words: QUALITY FIRST, and on a flourish connecting the initial T and the final E of the words in script is the inscription in very small type; TRADE MARK REG. U. S. PAT. OFF.; beneath this in two rows of large white type the words: ALL RUBBER REPAIR PATCH; then beneath this, in smaller type: SELF-VULCANIZING; SATISFACTION GUARANTEED OR MONEY REFUNDED. GUARANTEED BY TOURISTS PRIDE MFG. CO., MINNEAPOLIS, MINN.—inner tube repair patches. Joseph F. Fuchs, doing business as Tourists Pride Manufacturing Co., Minneapolis, Minnesota.

170,611 On a square cross-hatched in yellow a large U at center, with the letters WEAR one beneath another inside the prongs of the U; along the four sides of the square the words: GOODYEAR RUBBER COMPANY TRADE-MARK—rubber boots and shoes and arctics. Goodyear Rubber Co., Middletown, Connecticut.

170,629 RELLIM—solid and pneumatic rubber and fabric tires. The Miller Rubber Co., Akron, Ohio.

170,631 TRANSCORK—lining for automobile transmissions. Standard Motor Parts Co., Chicago, Illinois.

170,660 The mark consists of two rings of one or more beads or the like, each concentric with the inner and outer periphery of the side walls of a tire and serving to frame the usual lettering on said sidewall—automobile tire casings. The Cord Tire Corporation, Chester, West Virginia.

Granted July 17, 1923, Act of March 19, 1920, Section 1 (b)

170,685 PETER PAN, the letters arranged to describe a small semi-circle—golf balls. Manhattan Photo Supply Co., Inc., New York, N. Y.

170,687 MERIT—pneumatic and solid rubber tires, tubes, patches, inside and outside tire sleeves, rubber hose, portable tire vulcanizing outfits, and rubber gaskets. Stanley Glidden Co., Inc., Boston, Massachusetts.

170,688 GREATER GRIP—automobile fan belts, particularly fabric and rubberized fabrics. Teuscher & Son Machinery Supply Co., St. Louis, Missouri.

Granted July 24, 1923, Act of February 20, 1905

170,716 RAJAH, the J extending conspicuously above and below the line of the other letters—boots, shoes and slippers made wholly or in part of leather, rubber, canvas, or textile material. Alfred Hale Rubber Co., Quincy, Massachusetts.

170,731 JIFFY-ON—shoe heels. Charles H. Coulson, doing business as Coulson Heels Co., Hanover, Pennsylvania.

170,759 LASTIC—rubber boots, shoes and overshoes, and rubber-soled canvas shoes. Hood Rubber Co., Watertown, Massachusetts.

The Dominion of Canada

Registered

33,764 Two three-sided figures, arranged one within the other, having their sides curved, and each of the sides of one parallel, respectively, to the sides of the other; within the space so provided within the three sides of the figure are the words: RUBBER SERVICE LABORATORIES, one word being placed between each of the parallel sides; the letters RSL at the center of the figure—general. The Rubber Service Laboratories Co., Akron, Ohio, U. S. A.

33,767 Same description as for 33,764 except that at the center of the figure is the symbol: A-7—accelerator for use in the manufacture of vulcanized rubber, comprising the reaction products of an aldehyde and an amine. The Rubber Service Laboratories Co., Akron, Ohio, U. S. A.

33,774 Representation of an elephant—rubber ink and pencil erasers. Kohinoor Pencil Factory L. & C. Hardtmuth, Gerstnerstrasse 58 Budweis, Czecho-Slovakia.

33,776 APELLES—stationery supplies including ink and pencil erasers. Same firm address as for 33,774.

33,792 OLDFIELD, written once in empty Gothic type and once in type of diminishing size, the largest letter being the O, which consists of an automobile tire casing, the whole of the word being rounded so as to give the impression that the tire is rounding a curve at high speed. The Oldfield Tire Co., Akron, Ohio, U. S. A.

New Zealand

Published May 31, 1923

B17,572 FLEET FOOT, the top stroke of the F in both instances extending over the remainder of the word—footwear of canvas and rubber. Canadian Consolidated Rubber Co., Limited, 45 St. Alexander street, Montreal, Quebec.

19,969 TREO—corsets, girdles, etc., principally of elastic webbing. Treo Co., Inc., Jamaica, New York, N. Y., U. S. A.

The United Kingdom

Published June 27, 1923

433,691 The words: GRAMWILL RUBBABUBBLES, arranged one above the other—a toy balloon. The firm trading as W. G. Ingram, Junior, 161 Parnell road, Old Ford, London, E. 3.

433,692 Same words and arrangement as in No. 433,691—a sweetmeat. The firm trading as W. G. Ingram, Junior, 161 Parnell road, Old Ford, London, E. 3.

436,830 PRESIDENT—India rubber solution. Phillips' Patents, Limited, Old street, London, E. C. 1.

Published July 4, 1923

433,141 GOODRICH TAXICORD—rubber tires. The B. F. Goodrich Co., Limited, 117 to 123 Golden Lane, London, E. C. 1.

434,087 Within a circle at the center of a diamond-shaped background the head of a cat, and above it the words: KATZ BROTHERS, LTD—rubber goods in Class 40. Katz Brothers, Limited, ½ Pepys street, Seething Lane, London, E. C. 3.

435,989 Representation of horses racing, at the bottom of which is the word: THOROBRED—waterproof and rainproof garments. Philip Michael Quas-Cohen, trading as Cohen & Wilks, 44 Derby street, Cheetham, Manchester.

436,375 RUBACRETE—a product of rubber and cement for use in paving and in making floor and road surfaces. Gerald Otley Case, 7/8 Idol Lane, Great Tower street, London, E. C. 3, Eng.

437,262 THE FORTUNA—waterproof and rainproof garments. B. Lang & Co., Limited, 26 Bury New Road, Manchester.

Published July 11, 1923

B433,693 Representation of a shield having on its face three divisions bearing, respectively, a rose, a thistle, and a shamrock; across the top of the shield a streamer bearing the inscription: R. S. T. BRAND; above this emblem the words, in bold type: GARLOCK SPIRAL PACKING—Garlock spiral steam packing and Garlock spiral engine packing. The Greengate & Irwell Rubber Co., Limited, 5 Mill street, Ordsall Lane, Salford, Lancashire.

436,926 BEAR—rubber goods included exclusively in Class 40 but not including elastic webs or similar goods. The Leyland & Birmingham Rubber Co., Limited, 24 to 30 Duke street, Aldgate, London, E. C. 3.

Published July 18, 1923

427,224 S. S. WHITE—dental supplies, including dental rubber dams and appliances therefor. The S. S. White Dental Manufacturing Co., 211 South 12th street, Philadelphia, Pennsylvania, U. S. A.

436,905 VULPOST, the final stroke of the V overlining the rest of the letters of the word, which are also underlined—an adhesive preparation of rubber or gutta percha for tailors' use. Vultex Products, Limited, Kennans House, Crown Court, Cheapside, London, E. C. 2.

436,908 VULGRIP, arrangement, description and address same as for 436,905.

436,911 VULSTYX, arrangement, description and address same as for 436,905.

437,044 DELLEX—table mats of net or lace with heat insulators inside, the predominating material being rubber. Francis Florence Dell, 42 Baker street, London, W. 1.

437,392 VULPRO, arrangement, description and firm address same as for 436,095.

437,414 TOGGY—toys. The Atlantic Rubber Co., Limited, 167 Moorgate, London, E. C. 2.

438,038 PATHFINDER—all goods included in Class 40. The Goodyear Tire & Rubber Co., Akron, Ohio, U. S. A.

Published July 25, 1923

436,427 BEAR—steam and hydraulic packing included in Class 50. The Leyland & Birmingham Rubber Co., Limited, Aldgate, London, E. C. 3.

437,920 Representation of a falcon, a mountain peak outlined in the background—driving belts and belting and carrying belts and aprons composed wholly or principally of rubber, gutta percha or balata, and included in Class 40. William Walker & Sons, Limited, Bolton, Lancashire.

437,947 EXPRESS—goods of rubber and gutta percha exclusively in Class 40 but not including rubber tips and pads for heels and shoes, or similar articles. The Express Rubber Co., Limited, London, E. C. 2.

438,449 PLUS-FOURS—all goods included in Class 40. Blakey's Boot Protectors, Limited, Armley, Leeds.

Designs

The United States

Issued* July 3, 1923

62,599 Rubber heel. Term 14 years. Frank Berenstein, Chelsea, assignor to Panther Rubber Manufacturing Co., Stoughton, both in Massachusetts.

62,620 Tire. Term 3½ years. Walter N. Raach and Clinton E. Shurtliffe, Greenville Borough, assignors to The Shenango Tire & Rubber Co., Greenville, both in Pennsylvania.

Issued* July 10, 1923

62,659 Tire. Term 7 years. Charles H. Wheeler, East Palestine, Ohio.

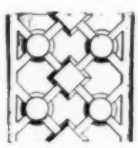
Issued* July 17, 1923

62,667 Tire. Term 14 years. Jackson D. Comstock, Chester, West Virginia.

62,620

62,659

62,667



62,682

62,671 Rubber Boot. Term 14 years. Alfred A. Glidden, assignor to Hood Rubber Co., both of Watertown, Mass.

62,682 Tire tread. Term 7 years. Edwin P. Weber, Chicago, Illinois.

Issued* July 24, 1923

62,716 Sole or tap. Term 14 years. Dudley Freeman, Roxbury, assignor to Panther Rubber Manufacturing Co., Stoughton, both in Massachusetts.

62,717 Shoe Heel. Term 14 years. Dudley Freeman, Roxbury, assignor to Panther Rubber Manufacturing Co., Stoughton, both in Massachusetts.

62,749 Doll. David Straiton, assignor to The Miller Rubber Co., both of Akron, Ohio.

* Under Rule No. 167 of the United States Patent Office, the issue closes weekly on Thursday, and the patents of that issue bear date as of the fourth Tuesday thereafter.

Prints

The United States

Registered July 10, 1923

6,796 THE ACE OF GOLF BALLS—for golf balls. The Fair, Chicago, Illinois.

6,797 KNICKER BOSTON GARTER—for men's garters. George Frost Co., Boston, Mass.

INSULITE FACTORY FLOORING

Insulite mastic flooring is made from elaterite or natural mineral rubber base mixed with asbestos and has gained such popularity that to date more than 10,000,000 square feet have been installed. It has remarkable wearing quality, is agreeable to the tread, noiseless, sanitary, elastic, self-healing in case of cuts and easy of repair in case of accidents.

In addition, its resistance to acids, non-absorbent and fire resistant qualities, etc., make it peculiarly suitable for chemical laboratory floors.—Insulite Chemical Co., Aurora, Illinois.

British Methods of Manufacturing Telephone Receivers

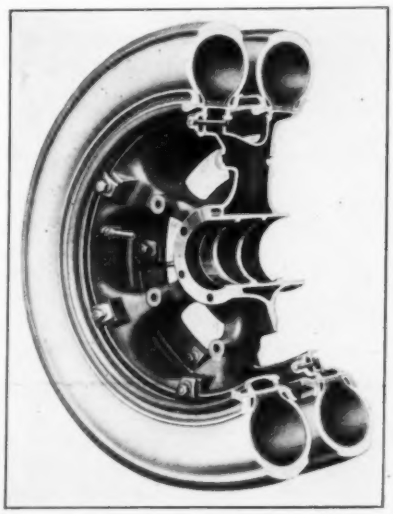
In the production of telephone receivers and parts the methods followed by English manufacturers differ considerably from those practised in the United States. Metal, for instance, is the chief material used instead of hard rubber dust, as is the custom with us, while "bulging" operations with water or rubber as the "bulging" medium are often utilized. In the manufacture of many drawn sheet metal parts this method of working is capable of performing, very economically, such operations as bending, forming, and expanding, which commonly mean much expense, cost of tools, and operating time.

The final operations after tinning the outside of the metal case consist in covering this case with rubber and vulcanizing it. Here two methods are ordinarily used. The first employs a solution of rubber and a succession of dippings or sprayings with intermediate bakings, while the second is to cover the case with sheet rubber, which is afterwards vulcanized in an ordinary tire vulcanizing pan. In the latter method the metal body of the case is covered with three pieces of sheet rubber, one for each half of the circumference and one piece in the form of a disk to cover the end. This method of building up the covering is necessary to ensure contact all round the case.

The sheets are fastened around the receiver case with strong rubber solution, which holds them in place during vulcanizing. Before this operation, however, the sheet must be rolled down into intimate contact with the face of the metal case so as to exclude all air between the two faces, since air causes blowholes. The end disk is fastened with rubber solution, and an aluminum plug is forced into the end of the case to retain the rubber inside the recess while vulcanizing, the plug being withdrawn after the process is completed. Aluminum is used, as it does not readily vulcanize to rubber.—*Machinery.*

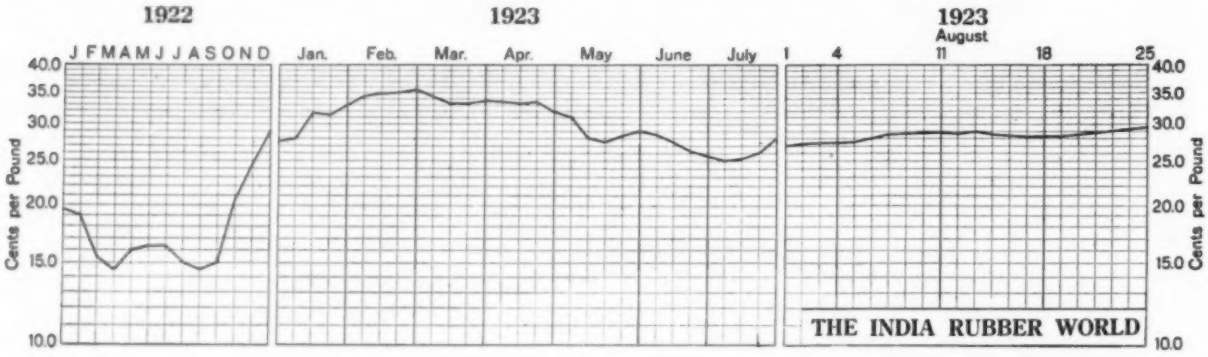
Dual Pneumatic Tires and Truck Wheel

The manufacturers claim that the Safety First idea is built right into the steel truck wheel here shown. These unique wheels are cast of electric furnace steel in one piece, with hollow spokes. The illustration shows the internal construction of a wheel for mounting detachable dual pneumatic tires as used on buses. This dual tire wheel takes small size tires, only one size, interchangeable all around. The spoke wheel has two felloes without pockets in which stones or dirt can lodge.



Dayton Steel Truck Wheel

A chassis equipped with these wheels is of lower height, making it easier for passengers in buses, for instance, to enter and leave the vehicle. Similar cast hollow spoke wheels are built for single pneumatic and solid truck tires. —The Dayton Steel Foundry Co., Dayton, Ohio.



Ratio Graph of New York Market Fluctuations—Average Prices of Spot Ribbed Smoked Sheets

Review of the Crude Rubber Market

New York

THE rapid rise in spot plantation rubber which took place during the last half of July carried the price to 29¾ cents on August 25. With the opening of August came a drop of one cent, followed immediately by a steady trend upward until on the 11th of the month the market reached 29 cents. This level was maintained for three days but by the 18th quotations had fallen off nearly a cent.

The rubber market in common with trade and business in all lines has been undergoing a somewhat severe and prolonged period of summer dullness and absence of buying interest. This is attributable to curtailment of tire output due to overproduction. Added to this, trading was suspended as a mark of respect to the late President Harding at the time of his death and on the day of his funeral and the day following.

The last half of the month the market continued dull in sympathy with the London market position. Rubber manufacturers generally are showing very little buying interest and prefer to postpone deliveries on contracts. Trading in general is light although the outlook for fall activity is encouraging. It is expected that more pronounced buying interest will develop on the part of the consuming interests at that time. October-December delivery on the 18th was quoted at 29⅛ cents and January-March at 30 cents.

The last week of the month was characterized by a firm market tone supported by rumors of orders placed in London and the Far East. Prices advanced slowly, 30 cents being quoted for ribs on August 27.

Parás and all other grades ruled in sympathy with plantations and without development of consumers' buying interest.

Imports of all grades during July, 1923, were 18,609 tons, compared with 25,245 tons one year ago. Plantation arrivals for July, 1923, were 17,459 tons, compared with 24,563 tons one year ago. Total importations of all grades for the seven months ended July 31 were 208,648½ tons, compared with 155,603 tons for the corresponding period of last year.

Spot and future quotations on standard plantation and Brazilian grades were as follows:

PLANTATION. August 1. Spot first latex crêpe, 27⅛ cents; August, 27⅛ cents; Aug.-Sept., 27¼ cents; Oct.-Dec., 28⅛ cents; Jan.-Mar., 29 cents.

August 25. Spot first latex crêpe, 29¾ cents; September, 29¾ cents; Aug.-Sept., 29⅞ cents; Oct.-Dec., 30¼ cents; Jan.-Mar., 30¾ cents.

August 1. Spot ribbed smoked sheets, 27⅛ cents; August, 27⅛ cents; Aug.-Sept., 27¼ cents; Oct.-Dec., 27⅛ cents; Jan.-Mar., 29 cents.

August 25. Spot ribbed smoked sheets, 29¾ cents; September, 29¾ cents; Aug.-Sept., 29⅞ cents; Oct.-Dec., 30¼ cents; Jan.-Mar., 30¾ cents.

August 2. Spot No. 1 amber crêpe, 26¼ cents; August, 26¼ cents; Aug.-Sept., 26⅜ cents; Oct.-Dec., 27¼ cents; Jan.-Mar., 28¼ cents.

August 25. Spot No. 1 amber crêpe, 28½ cents; September, 28⅝ cents; Aug.-Sept., 28⅞ cents; Oct.-Dec., 29½ cents.

August 1. Spot No. 1 rolled brown crêpe, 25¾ cents; August, 25¾ cents; Aug.-Sept., 26 cents; Oct.-Dec., 26¾ cents.

August 25. Spot No. 1 rolled brown crêpe, 27 cents; September, 27⅞ cents; Aug.-Sept., 27⅞ cents; Oct.-Dec., 27¾ cents.

SOUTH AMERICAN PARAS AND CAUCHO, August 1. Spot, upriver fine, 27¼ cents; islands fine, 25 cents; upriver coarse, 23¾ cents; Cametá, 14 cents; caucho ball, 24¼ cents.

August 25. Spot, upriver fine, 28¾ cents; islands fine, 27 cents; upriver coarse, 23¾ cents; Cametá, 15 cents; caucho ball, 22½-24½ cents.

London

The London market opened with spot ribbed smoked sheets steady and strong at 15*d*. The market generally has been dull and as a whole firm and steady, with persistent rising tendency as the month advanced. Continued absence of consumers' interest has prevailed although the fall outlook is reported encouraging as on this side.

Reported London spot stocks continue to show a steady slow decline from week to week. The record is as follows: July 24, 49,985 tons; August 1, 49,689 tons; August 8, 49,420 tons; August 14, 49,178 tons; August 21, 48,553 tons.

New York Quotations

Following are the New York spot quotations per pound, for one year, one month ago, and August 25, the current date:

Plantation Hevea

	August 25, 1922	July 25, 1923	August 25, 1923
LATEX			
Rubber latex (Hevea)....	@	*gal.* $1.25@1.30	*gal.*$1.25@1.30
CREPE			
First latex .....80.	13⅞@	.28 @.28½	.29¾@
Off latex	.13¾@	.27¾@.27¾	.29½@
Amber No. 1.....	.13¾@	.27⅛@.27¼	.29 @
Amber No. 2.....	.13⅜@	.26¾@.27	.28½@
Amber No. 3.....	.13⅛@	.26¼@.26½	.28 @
Brown, clean, thin.....	.13 @	.26¼@.26½	.28 @
Brown, specky	.12½@	.25¾@.26	.27¾@
Brown, rolled	.11½@	.26 @.26¼	.27¾@

Crude Rubber Market—*Continued*

	August 25, 1922	July 25, 1923	August 25, 1923
SHEET			
Smoked, ribbed	.13¾@	.27¼@.28½	.29¾@
Smoked, plain	@	.27 @.27½	@
Unsmoked	@	†.26½@	@
SCRAP			
Colombo scrap No. 1	.10½@	†.25 @	.23 @.25
Colombo scrap No. 2	.09 @	†.23 @	@
East Indian			
PONTIANAK			
Banjermassin	.07¼@	.07 @.07½	.07½@
Palembang	.08¼@	.07¼@.07¾	.08 @
Pressed block	.12 @	.12½@.13	.12½@
Sarawak	.06½@	.06½@.07	.07 @
South American			
PARAS			
Upriver, fine	.18½@	.27¼@.27½	.28¾@
Upriver, fine	*.29 @	@	*.36¾@
Upriver, medium	.16 @.17	.24½@.24¾	†.27 @
Upriver, coarse	.13½@	.23¾@.24	.23¾@
Upriver, coarse	@	@	*.34½@
Islands, fine	.16½@.16¾	.25 @.25¾	†.27 @
Islands, medium	.15¾@	.24 @	@
Islands, coarse	.09 @	.14 @.14¾	.23¾@
Cametá	.09½@	.14 @.14½	.15 @
Acre Bolivian, fine	.18½@	.27½@	.29 @
Acre Bolivian, fine	*.29 @	@	*.37 @
Beni Bolivian	.18⅝@	.27¾@	.29½@
Madeira, fine	.19½@.21	.27¾@.28	†.30 @
Peruvian, fine	.17½@	@	†.26½@
Tapajos, fine	.17¼@.17½	.26¼@	.27½@
CAUCHO			
Upper caucho ball	.13 @.13¼	.24½@.24¾	.24 @.24½
Upper caucho ball	.19 @	@	*.34½@
Lower caucho ball	.10¾@.11¼	.24 @	.22½@
Maniçobas			
Ceará negro heads	†.09 @	@	@
Ceará scrap	†.05 @	@	@
Maniçoba 30% guaranty	.07 @	@	@
Mangabeira, thin sheet	†.11 @	@	@
Centrals			
Central scrap	.10 @.11	.17 @.18	.17 @.17½
Central wet sheet	.05 @.07	.10 @.12	.10 @.12
Corinto scrap	.10 @.11	.17 @.18	.17 @.17½
Esmeralda sausage	.10 @.11	.17 @.18	.17 @.17½
Guayule washed & dried	.26 @	.26 @	.27 @
Africans			
Benguela, No. 1, 28½%..	@	†.18 @	@
Benguela, No. 2, 32½%..	.06 @	.15 @	.15 @
Congo prime, black upper	.09 @.10	.22 @.24	@
Congo prime, red upper	.11 @	.23 @	@
Kassai, black	.10 @	.22 @.24	.22 @.23
red	.09½@	.23 @	.20 @.21
Gutta Percha			
Gutta Siak	.14½@.15	.17½@.18	.60 @.61
Gutta Soh	@	@	.23¼@
Red Macassar	2.75 @3.90	3.00 @	3.00 @
Balata			
Block, Ciudad Bolivar	.53 @	.70 @.71	.71 @
Colombia	.45 @	.58 @.60	.60 @.61
Panama	@	.58 @.60	.60 @.61
Surinam, sheet	.68 @	.74 @	.80 @
amber	.72 @	.75 @	.85 @.86
Chicle			
Colombia	.50 @	.25 @	.25 @
Honduras	.70 @.72	.62 @	.62 @
Venezuela	.70 @.72	.63 @	.63 @
Yucatan, fine	.75 @	.65 @	.65 @

*Washed and dried crêpe. Shipment from Brazil.
†Nominal.

Comparative Low and High New York Spot Rubber Prices

	August 1923*	August 1922	August 1921
PLANTATIONS			
First latex crêpe	$0.27½@$0.29¾	$0.13¾@$0.14¾	$0.14¼@$0.17
Smoked sheet, ribbed	.27⅛@.29¾	.13⅜@.14¾	.13½@.15
PARAS			
Upriver, fine	.27 @.28⅛	.18¼@.19½	.17 @.19½
Upriver, coarse	.23 @.24½	.13 @.14	.08¾@.11½
Islands, fine	.25 @.26¼	.17¼@.17¾	.16½@.18½
Islands, coarse	.. @..	.08¾@.09½	.07 @.08
Cametá	.14 @.15	.08¾@.09½	.07½@.09

*Figured to August 25, 1923.

Amsterdam Rubber Market

JOOSTEN & JANSSEN, Amsterdam, report under date of August 17, 1923:

In the beginning of the week the tendency on the rubber market was not so bad, but sellers soon came out while the demand remained very poor, especially for spot and nearby rubber so that prices gradually declined.

Only on the terminal market the turnover was of some importance.

The close is at the lowest point as follows:

Hevea crêpe and sheets Fl.	$0.80½	Spot.
Hevea crêpe and sheets Fl.	.82	October to December.
Hevea crêpe and sheets Fl.	.84	January to March.

Reclaimed Rubber

Manufacturers of reclaims report the development during August of a distinct demand by consumers for the highest grades, resulting in a natural tightening of the raw material supplies and prices. Increased demand for all grades is looked for in September, and while this movement has not yet begun the market shows exceptionally keen competition. Such a condition is entirely unwarranted except on the part of reclaimers with heavy inventories of finished products.

New York Quotations

AUGUST 25, 1923

Prices subject to change without notice

Reclaimed Stocks

FRICTION		
Compounded	*lb.*	$0.19 @$0.20
Pure gum friction	*lb.*	.22¾ @ .24
TUBE		
Compounded	*lb.*	.12¾ @ .13¼
Floating	*lb.*	.16 @ .16½
AUTO TIRE		
Black	*lb.*	.09½ @ .09¾
Gray	*lb.*	.11 @ .11½
White	*lb.*	.13¼ @ .13½
Black, washed	*lb.*	.11 @ .11¼
SHOE		
Unwashed	*lb.*	.10½ @ .11
Washed	*lb.*	.13¼ @ .13½
Mechanical	*lb.*	.10 @ .11
TRUCK TIRE		
High grade red	*lb.*	.13½ @ .14
Black	*lb.*	.08¾ @ .09

New York Average Spot Rubber Prices

PRICES IN CENTS PER POUND

PLANTATIONS:	July, 1923																				August, 1923			
	9	10	11	12	13	14	16	17	18	19	20	21	23	24	25	26	27	28	30	31	1	2	3*	4*
Sheet																								
Ribbed smoked	25⅛	25	24¼	24¼	24⅞	24⅞	25¼	25¼	25¼	27	27¼	27⅜	26¼	27¼	28	27⅜	28	27½	27½	27⅜	27	27⅜	....	....
Crêpe																								
First latex	25⅛	25⅛	24⅞	24⅞	25	25	25⅜	25⅞	26	27⅛	27⅞	27½	26⅞	27⅜	28⅛	27⅞	28	27¼	27⅞	27½	27⅛	27½	....	....
Off latex	24½	24½	24¼	24¼	24½	24⅜	24⅝	25⅛	25⅜	26	27¼	27⅛	26⅜	26¾	27½	27⅜	27½	27⅜	27⅛	27⅛	26⅝	27	....	....
No. 1 blanket	24½	24½	24⅜	24⅛	24½	24½	24⅜	25	25⅛	25⅝	27	26¾	26¾	26⅝	27⅛	27⅛	27⅛	26¾	26⅞	26¾	26⅜	26⅛	....	....
No. 2 blanket	24⅛	24⅛	24	23⅝	24⅛	24	23⅞	24½	24½	25¼	26½	26¼	25⅞	26⅛	26½	26½	26⅝	26⅜	26⅜	26¼	25⅞	26⅛	....	....
No. 3 blanket	23¾	23⅝	23⅝	23⅜	23¾	23½	23⅝	24	23⅞	24¾	26	25¾	25⅜	25⅝	26¼	26¼	26⅛	25⅞	25⅞	25¾	25⅜	25¾	....	....
Thin, clean, brown	24⅛	23¾	23¾	24	24	23⅞	23⅞	24½	24½	25½	26⅜	26⅜	25⅞	26	26⅝	26¾	26¼	26½	26⅜	26⅜	26	26	....	....
Specky brown	23⅝	23⅜	23¼	23⅜	23½	23⅜	23⅜	23¾	23⅞	24⅞	25½	25⅜	25¼	25½	26⅛	26¼	26⅜	26	25⅞	25⅝	25½	25⅜	....	....
Rolled brown	23⅝	23⅜	23⅜	23⅜	23¼	23⅛	23⅛	23¾	23⅞	24½	25⅜	25¼	24¾	25¼	25⅝	25¾	25¾	25¾	25¾	25⅝	25⅜	25½	....	....

* Trading suspended.

The Market for Rubber Scrap

New York

During the past month the market for rubber scrap has been extremely quiet on all grades. Reclaimers are not actively seeking stocks, in view of the seasonal slackness in all lines of the rubber industry using their product. All grades of scrap are at rock bottom prices and show an upward tendency in correspondence with a recent increase of interest and the stiffening of the price for crude rubber.

BOOTS AND SHOES. Dealers' bids have advanced during the month from $2.75 a hundred to $3.00.

TIRES. Tires have advanced only slightly over the bids one month ago and less demand and a waiting attitude on the part of reclaimers is noted. There is no call for solid tires.

INNER TUBES. Prices hold firm. There is some increase in inquiries. Bids on No. 1 continue to range from $4.25 to $4.75 a hundred and on No. 2 red around $3.00 to $3.25 a hundred.

AIR-BRAKE HOSE. The market is dull and prices nominal.

MECHANICALS. There continues to be no market for this grade.

Quotations for Carload Lots Delivered

August 25, 1923

Prices subject to change without notice

Boots and Shoes			
Boots and shoes, black	lb.	$0.03 @	.03⅛
Trimmed arctics	lb.	.02¼ @	.02½
Untrimmed arctics	lb.	.01¾ @	.01⅞
Hard Rubber			
Battery jars, black compound	lb.	.02 @	.02½
No. 1 scrap	lb.	.09 @	.10
Inner Tubes			
No. 1	lb.	.04½ @	.04⅞
No. 2 red	lb.	.03¼ @	.03½
Mechanicals			
Black scrap, mixed	lb.	.01¾ @	
Heels	lb.	.00½ @	.00¾
Horse-shoe pads	lb.	.02¾ @	.03¼
Hose, air brake	lb.	.00¾ @	.01
regular	lb.	.00½ @	.00¾
Red, scrap, mixed	lb.	.01¼ @	.02⅞
White scrap, mixed	lb.	.01¾ @	.02⅞
Tires			
PNEUMATIC			
Auto peelings	lb.	.01½ @	.01¾
Bicycle	lb.	.00⅞ @	
Standard white auto	ton	27.50	@37.50
Mixed auto	ton	14.00	@16.00
Stripped, unguaranteed	ton	10.00	@12.50
SOLID			
Carriage	ton	25.00	@30.00
Irony	ton	10.00	@15.00
Truck, clean	ton	25.00	@30.00

PHILIPPINE RUBBER INVESTIGATION

The personnel of the Department of Commerce expedition that is to investigate Philippine rubber possibilities is as follows.

C. F. Vance, of Troy, Ohio, who is in charge of the expedition has had 15 years' experience and is thoroughly conversant with the rubber situation of the Philippines.

Mr. Vance will be assisted by Alex H. Muzzall, Carpinteria, California, a practical rubber plantation man who was for many years connected with the Goodyear Sumatra plantations; by John P. Bushnell, Washington, D. C., assistant trade commissioner, Department of Commerce, who has been connected with rubber investigation activities since its inception; and by Mark Baldwin, Bureau of Soils, Department of Agriculture. The party will sail from Seattle, Washington, on September 11.

Steady Growth of American Rubber Goods Exports

Statistics regarding exports of American rubber manufactures, as prepared by *Commerce Reports*, have much of encouragement for the rubber industry. Exports during the first six months of this year were valued at $21,081,995, an increase of $3,961,075 and $4,335,436, respectively, over the corresponding periods of 1922 and 1921. The value of rubber goods exported has increased steadily since 1921, notwithstanding price reductions which have occurred in all lines of rubber products. Quantity shipments during the first half of 1923 were also fully 35 per cent heavier than during the corresponding period of 1922.

VOLUME OF UNITED STATES EXPORTS OF RUBBER PRODUCTS

Article		1922 First Half Year	1922 Second Half Year	1923 First Half of 1923
Rubber boots	pairs	104,970	136,949	137,000
Rubber shoes	pairs	299,156	564,403	272,296
Canvas rubber-soled shoes	pairs	1,474,471	1,503,156	2,452,947
Automobile casings	number	660,832	665,388	894,322
Other casings	number	26,945	27,986	51,808
Automobile tubes	number	429,769	506,949	625,748
Other tubes	number	18,704	21,659	34,856
Solid tires for autos	number	25,207	30,458	49,374
Other solid tires	pounds	368,537	401,320	491,295
Rubber belting	pounds	949,651	1,635,683	1,749,505
Rubber hose	pounds	1,570,695	1,810,515	2,283,613
Rubber packing	pounds	488,331	661,115	710,079
Rubber soles and heels	pounds	655,968	1,078,428	961,865
Rubber thread	pounds	506,895	555,672	561,670
Druggists' rubber sundries	pounds	416,978	378,815	427,721
Hard rubber goods	pounds	436,033	608,349	785,706
Tire repair materials	pounds	357,617	414,553	410,318
Rubber manufactures n. e. s.*	pounds	2,446,421	2,153,500	2,990,220

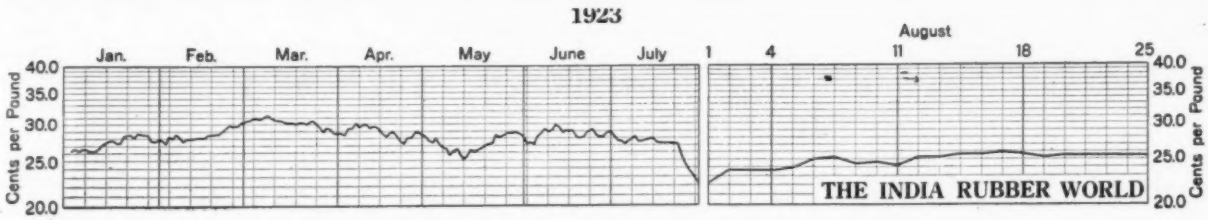
*Not elsewhere specified.

The tabulation as given above shows increases in every line of production except that of rubber shoes, while the development of the trade in tires and tubes, canvas rubber-soled shoes, and belting, hose, and packing, is especially noteworthy.

Automobile tires, which are being exported at a rate 35 per cent higher this year than last, constituted 58.3 per cent of the total value of United States exports during the half year. There is also a greatly increased trade in casings and tubes other than for automobiles. In the development of the market for mechanical rubber goods British South Africa is playing a leading part, standing first on the list as purchaser of our rubber belting, while exports to Chile, Argentina, Norway, Australia, England, Brazil, British East Africa, Cuba, Portuguese East Africa, Belgium, the Dutch East Indies, and Peru have increased notably.

Another surprising advance is represented in the demand for our canvas shoes with rubber soles, exports of such goods having increased approximately 70 per cent over last year, and rubber boots approximately 30 per cent. During 1922 five countries (Cuba, the Philippine Islands, Argentina, England, and Mexico) imported over 76 per cent of our shipments of canvas rubber-soled footwear, taking, during the first half of 1923 over 80 per cent of such shipments. Half the remainder went to Denmark, Norway, Uruguay, British South Africa, and the Dutch West Indies. Statistics indicate that our principal competitors in the rubber footwear trade are France, Austria, Great Britain, Canada, Germany, and Sweden, in the order of estimated total shipments during 1922. With the total world export trade for 1922 in rubber footwear considered as amounting to about 16,000,000 pairs of rubber boots and shoes, including canvas rubber-soled shoes, the United States for that year led in the quantity of her shipments, while present indications are that she will continue to hold the first place among nations along this and perhaps other lines during 1923.

ITALY'S IMPORTS OF RUBBER, GUTTA PERCHA, AND MANUFACTURES thereof during 1922 amounted to 109,777,366 lire; exports for the same period were 156,428,145 lire.



Ratio Graph of New York Market Fluctuations—Daily Prices of Spot Middling Upland Cotton

The Market for Cotton and Other Fabrics

New York

AMERICAN COTTON. The spot cotton market during the last week of July declined to 22.45 cents on July 30, attributed to rains in Texas, dullness of cotton goods, and depressing cables from Liverpool and Manchester. A sharp reaction, however, set in August 1, on publication of the government crop outlook of 67.2 per cent, which is nearly three per cent under the private estimate. Spot cotton price, therefore, reacted upward from the 22.45 cent level to 25.35 on August 25, with tendency to rise further.

EGYPTIAN COTTON. Prices for Medium Uppers and Saks have shown a slight rising tendency in sympathy with American cotton. Medium grade Saks for spots were offered around 34½ cents in Boston on August 22. New crop reports indicate 6,000,000 to 6,250,000 cantars under favorable conditions. The carry-over this season is only 440,000 bales, against 659,000 last year and 687,000 two years ago, representing the smallest supply available for several years. The world consumption has aggregated 975,000 bales this season against 748,000 bales last season and 516,000 bales two years ago. In the past two years the United States has increased its consumption from 103,000 bales to 180,000 bales.

ARIZONA COTTON. Early in the month Pimas were offered as low as 33 cents for the medium grades and other grades correspondingly lower. The prospect of a lower crop yield is expected to advance the price. No. 1 are priced at 35 cents and No. 2 at 34 cents. The difference in price levels is more pronounced on Pimas than on American cotton.

Cotton Fabrics

DUCKS, DRILLS AND OSNABURGS. There has been a slight decline in the prices of ducks and drills, while osnaburgs have remained steady. Business has been routine, due to the vacation season and reduced activity of rubber mills. Goods are selling below cost of production and cotton factories are operating at fractional capacity. On account of abstemious buying there will probably be a shortage of supplies before November.

RAINCOAT FABRICS. The raincoat trade has not been actively purchasing stocks the past month and prices are nominal.

SHEETINGS. Sheeting continues dull and practically every consuming channel is greatly restricted. Mills have been generally closed for vacation periods or operating on a greatly reduced schedule.

TIRE FABRICS. Prices have remained nominal for the past month on both Egyptian and Peeler grades. Tire manufacturers generally have continued to curtail output on account of tire overstock. Likelihood of the continuance of this condition restrains the demand for tire fabrics seriously and is leading to temporary retrenchment in the fabric production. It is said that the tire fabric industry has been over-expanded. The tire cord business is reported largely lost by New England mills to southern competition and to fabric mills spinning their own yarns and thus has led to the installation of looms for the production of plain and fancy gray goods, etc.

The price situation in tire fabric continues nominal in the absence of buying activity.

New York Quotations

August 25, 1923

Prices subject to change without notice

Drills

38-inch 2.00-yard	*yard*	$0.22 @
40-inch 3.47-yard		.12⅛ @
52-inch 1.90-yard		.22⅝ @
60-inch 1.52-yard		.29½ @

Duck

CARRIAGE CLOTH

38-inch 2.00-yard	*yard*	.23½ @
40-inch 1.47-yard		.31¼ @
72-inch 16.66-ounce		.52 @
72-inch 17.21-ounce		.56 @

MECHANICAL

Hose	*pound*	.41 @
Belting		.40 @

TENNIS

51-inch 1.35-yard	*yard*	.36 @

Osnaburgs

40-inch 2.35-yard	*yard*	.20 @
40-inch 2.48-yard		.19 @
40-inch 3.00-yard		.15⅜ @
37½-inch 2.42-yard		.19½ @

Raincoat Fabrics

COTTON

Bombazine 64 x 60	*yard*	$0.12½ @
Bombazine 60 x 48		.11½ @
Cashmeres 36-inch, tan		.55 @
Plaids 60 x 48		.12¼ @
Plaids 56 x 44		.11¾ @
Surface prints 60 x 48		.12½ @
Surface prints 64 x 60		.13½ @

Sheetings, 40-inch

48 x 48, 2.50-yard	*yard*	16¼ @
48 x 48, 2.85-yard		.13¾ @
64 x 68, 3.15-yard		.14½ @
56 x 60, 3.60-yard		.11¾ @
48 x 44, 3.75-yard		.10¾ @
44 x 44, 5.50-yard		@

Sheetings, 36-inch

48 x 48, 5.00-yard	*yard*	.08⅝ @
44 x 40, 6.00-yard		.07¼ @
40 x 40, 6.25-yard		.06¾ @

Silks

Canton, 38-inch	*yard*	$0.37½ @
Wide Sateens	*lb.*	.44 @ .46

Tire Fabrics

BUILDING

17¼-ounce Sakellaridis, combed	*pound*	.73 @
17¼-ounce Egyptian, combed		.64 @
17¼-ounce Egyptian, carded		.58 @
17¼-ounce Peeler, carded		.52½ @

CORD

15-ounce Egyptian, combed	*pound*	.66 @
15-ounce Egyptian, carded		.60 @
15-ounce Peeler, carded		.54¼ @

BREAKER

Leno, Peeler, carded		.52½ @

CHAFER

9¼-ounce Egyptian, carded	*pound*	.64 @
9¼-ounce Peeler, carded		.58½ @

The Market for Chemicals and Compounding Ingredients

New York

TRADE in chemicals and rubber compounding ingredients has been dull during the past month. More interest was developed than in July, however, and fall revival is looked for. Advance in pig lead stiffened the pigment market.

ANILINE. Aniline has been quiet for several weeks. Stocks have decreased and demand is improving.

ASBESTINE. Prices have declined a little and movement of stocks has been routine.

BARYTES. Prices have remained firm and unchanged, consumption routine, with evidences of improvement in buying interest.

BENZOL. A month ago both export and domestic demand were fair but have since fallen off in marked degree. Stocks have reached large proportions. Prices are held steady in anticipation of early renewal of buying by consumers.

BLANC FIXE. This material is in good supply. The market holds quiet and prices steady.

CARBON-BLACK. Tire makers have been accepting delivery on contracts in anticipation of fall requirements. Spot stocks are in good supply. Fair buying interest is evident and consumption is steadily increasing. Increased facilities for production, now in process of development, have not yet come into operation.

CHINA CLAY. Market conditions remain unchanged. This material goes steadily into consumption. Rubber makers have accepted it on its merits as a standard compounding ingredient.

DRY COLORS. Dry colors have not been active. A few changes in price have been made downward. Competition is reported sharp.

LITHARGE. Consumers are buying as little as possible owing to seasonal dullness. Prices steady.

LITHOPONE. Lithopone makers are reported busy on old orders. New business is not large. Some importation of Belgian lithopone is noted.

SOLVENT NAPHTHA. This material continues in short supply and active request.

SUBLIMED LEAD. The market condition is essentially the same as in the case of litharge. Prices steady.

SULPHUR. The market is characterized by steady prices and routine movement.

TALC. Unstinted use of talc by every rubber factory helps to maintain the steady movement of this material for which there is no substitute.

WHITING. The market for this basic rubber ingredient, like that for sulphur and talc, shows very little change. Consumption aggregates heavy tonnage in routine movement.

ZINC OXIDE. Tire makers are not buying in heavy quantity because of the general reduction of scheduled tire output. Fall activity is anticipated following the present waiting market. There has been no reduction in price.

New York Quotations

August 25, 1923

Acids

Acetic 28% (bbls.)	cwt.	$3.38	@$3.63
glacial, 99%	cwt.	12.78	@13.03
Cresylic (97% straw color)	gal.	1.00	@ 1.05
(95 dark)	gal.	.95	@ 1.10
Sulphuric, 66 degrees	ton	15.00	@16.00

Alkalies

Caustic soda	cwt.	3.80	@
flake, 76% (factory)	cwt.	3.50	@
solid, 76% (factory)	cwt.	3.15	@

Colors

BLACK			
Bone, powdered	lb.	.05½@	.07½
Carbon-black	lb.	.13 @	.18
pressed	lb.	.14 @	.20
Drop	lb.	.07½@	.10
Gritless black	lb.	.40 @	
Ivory black	lb.	.15 @	.45
Lampblack	lb.	.12 @	.40
Micronex	lb.	.14 @	.20
Shawinigan	lb.	.17 @	.18
BLUE			
Cobalt	lb.	.21 @	.26
Gritless blue	lb.	3.50 @	
Prussian	lb.	.55 @	.60
Ultramarine	lb.	.15 @	.35
BROWN			
Iron oxide	lb.	.04½@	.05½
Sienna, Italian	lb.	.05½@	.14¼
Umber, Turkey	lb.	.04 @	
GREEN			
Chrome, light	lb.	.30 @	.32
medium	lb.	.32 @	.34
dark	lb.	.34 @	.42
commercial	lb.	.12 @	
tile	lb.	.13 @	.15
Gritless green	lb.	3.50 @	
Oxide of chromium	lb.	.39½@	.60
RED			
Antimony, crimson	lb.	$0.45 @	
crimson, 15/17% free	lb.	.36 @	.45
crimson, R.M.P. No. 3	lb.	.50 @	
crimson F.	lb.	.35 @	.45
Antimony, golden	lb.	.20 @	
golden R.M.P. No. 7	lb.	.21 @	
golden, 15/17% free	lb.	.20 @	
golden, No. 1	lb.	.30 @	
golden, No. 2	lb.	.20 @	
Tideco	lb.	.23 @	.52
7-A	lb.	.35 @	
Vermilion, 5% F. S.	lb.	.65 @	
Vermilion 15/17% F. S.	lb.	.50 @	
Arsenic sulphide, red	lb.	.15½@	
Gritless red (four shades)	lb.	3.50 @	
purple	lb.	2.50 @	
Indian maroon, English	lb.	.08 @	.12
Iron oxide, reduced	lb.	.08 @	.12
pure bright	lb.	.12 @	.17
Maroon oxide	lb.	.08 @	.12
Red oxide	lb.	.03½@	.04½
crimson	lb.	.06½@	
English	lb.	.12 @	
Spanish	lb.	.03 @	.04
Oximony	lb.	.16 @	
Para toner	lb.	1.00 @	1.10
Toluidine toner	lb.	2.25 @	3.00
Venetian	lb.	.05½@	.06
Vermilion, English	lb.	@	
WHITE			
Albalith	lb.	.07 @	
Aluminum bronze	lb.	.55 @	.60
Lithopone, domestic	lb.	.07 @	.07½
Azo	lb.	.07 @	.07½
Red Seal, imported	lb.	.06¾@	.07
Zinc oxide:			
French process, Florence brand			
Green seal	lb.	.10¾@	.11¼
Red seal	lb.	.09¾@	.10¼
U. S. P.	lb.	.16 @	.18
White seal	lb.	.12 @	.12¼
Horse Head brands			
Selected	lb.	.08½@	.09
Special	lb.	.08½@	.09
XX red	lb.	.08¼@	.08½
Leaded brands			
Lehigh	lb.	.07¼@	.07¾
Standard	lb.	.07¼@	.07¾
Sterling	lb.	.07¼@	.07¾
Superior	lb.	.07¼@	.07¾
Palmerton process			
Kadox, black	lb.	.09¾@	.10¼
blue	lb.	.09½@	.10
red	lb.	.09¾@	.09¾
Snow white	lb.	.12¼@	
Azo (factory):			
ZZZ (lead free)	lb.	.08 @	.08½
ZZ (—5% leaded)	lb.	.07¼@	.07¾
Z (8.15% leaded)	lb.	.07¼@	.07¾

Accelerators, Inorganic

Lead, carbonate	lb.	$0.09¼@	
Lead, red	lb.	.10@	
sublimed blue	lb.	.08¾@	
sublimed white	lb.	.08¾@	
Lime, flour	lb.	.02½@	
R. M. hydrated	ton	15.00 @	
superfine	lb.	.02 @	
Litharge, domestic	lb.	.10-2/5@	*10½
imported	lb.	*.17 @	
Magnesia, carbonate, light	lb.	.07¾@	.08¾
calcined, light (bbls.)	lb.	.23 @	.24
calcined, ex. light (bbls.)	lb.	.45 @	
calcined, md. light (bbls.)	lb.	.15 @	
calcined, heavy (bbls.)	lb.	.05 @	
Orange mineral A.A.A.	lb.	.13@	
Rubber lead	lb.	.10 @	
Sulzin, ton lots	lb.	@	
less ton lots	lb.	@	

Accelerators, Organic

A-7	lb.	.75 @	
A-19	lb.	.85 @	
Accelemal	lb.	.35 @	
Accelerene (f. o. b. English port)	lb.	13s. @	
Aldehyde ammonia powder	lb.	.95 @	
Aniline (f. o. b.) factory	lb.	.16½@	
sulphate	lb.	.33 @	
Cryline	lb.	.60 @	
Diphenyl diamino carbazol	lb.	.38 @	
Diphenylguanidine	lb.	1.20 @	
Ethylidene aniline	lb.	.70 @	.75
Excellerex	lb.	.45 @	.50
Formaldehyde aniline	lb.	.52½@	
H. R.	lb.	1.40 @	1.50
Hexamethylene tetramine	lb.	.95 @	.97½
Lead cleate (bbls.)	lb.	.14½@	.15½
Methylene aniline	lb.	.40 @	
No. 999	lb.	.16 @	
Paraldehyde	lb.	.17 @	.19
Para-nitros-dimethyl aniline	lb.	.25 @	
Paraphenylene diamine	lb.	1.40 @	1.45
Quinodine	lb.	.65 @	
Super-sulphur, No. 1	lb.	.50 @	.60
No. 2	lb.	.25 @	.35
Super-X	lb.	.30 @	
Tuads (Tetramethyl thiuram-disulphide)	lb.	6.00 @	
Thiocarbanilide	lb.	.26 @	.28
Triphenylguanidine	lb.	1.00 @	
Vul-Ko-Cene	lb.	.33 @	

*Nominal.

Colors—*Continued*

YELLOW

Arsenic	lb.	$1.00	@
Chrome, light and med.	lb.	.18	@ .19
Gritless yellow	lb.	3.50	@
India rubber	lb.	.87½	@
Ochre, domestic	lb.	.02½	@ .03
imported	lb.	.02	@ .03½

Compounding Ingredients

Aluminum flake (carloads)	ton	29.00	@
filler	ton	12.00	@
hydrate, light	lb.	.18	@ .20
Ammonia carbonate	lb.	.10¼	@ .11¼
Asbestine	ton	20.00	@
Aluminum silicate	ton		@
Barium, carbonate, precip.	ton	66.00	@73.00
dust	lb.	.05	@ .06
Barytes, pure white C. L.	ton	23.90	@
off color	ton	20.00	@
uniform floated	ton	23.90	@
water ground and floated	ton	28.00	@31.00
Basofor	lb.	.04¾	@
Blanc fixe	lb.	.04¼	@ .04½
Carrara filler (factory)	lb.	.01¾	@
Chalk, precip. extra light	lb.	.04¼	@ .05
heavy (f.o.b. factory)	lb.	.03¼	@ .04
China clay, Dixie	ton	22.00	@32.00
Blue ribbon (carloads)	ton	14.00	@
Blue Ridge	ton	20.00	@30.00
Super Dixie	lb.	.02½	@
Tideco	ton	10.00	@
Cotton flock, black	lb.	.12	@
light-colored	lb.	.13	@ .14
white	lb.	.14½	@ .21
Cotton linters clean mill-run	lb.	.05½	@
Fossil flour (powdered)	ton	60.00	@
(bolted)	ton	60.00	@
Glue, high grade	lb.	.30	@ .40
medium	lb.	.20	@ .26
low grade	lb.	.16	@ .19
Graphite, flake	lb.	.06½	@ .12
amorphous	lb.	.05	@
Infusorial earth (powd.)	ton	60.00	@
(bolted)	ton	65.00	@
Lime (bolted)	lb.	.02	@
Mica, amber	lb.	.05	@
powdered	lb.	*.15	@
white	lb.	.06	@
Pumice stone, powdered	lb.	.03	@ .05
Rotten st., powd. (bbls.)	lb.	.02½	@ .04½
Soap bark, cut	lb.	.09	@ .10
Soapstone, powdered, gray.	ton	12.00	@
Sodium bicarbonate (bbls.)	lb.	.02¾	@
Starch, powd. corn (bags)	cwt.	3.22	@ 3.32
(bbls.)	cwt.	3.49	@ 3.59
Talc, soapstone	ton	15.00	@20.00
Terra blanche	ton	25.00	@27.50

* Nominal.

Chemical Market—*Continued*

New York Quotations

August 25, 1923

Whiting, Alba	cwt.		@
chalk, L. H. B.	ton	$18.00	@25.00
commercial	cwt.	1.15	@ 1.50
English cliffstone	cwt.	1.75	@ 2.50
gilders (bolted)	cwt.	1.10	@
K. T.	ton		@
Perfection (carloads)	ton	22.00	@25.00
Quaker	ton	13.00	@15.00
Superfine, L. H. B.	ton	13.50	@22.50
W. T.	ton	12.00	@
York	ton	12.00	@
Wood pulp, XXX	ton	35.00	@
X (f. o. b. factory)	ton	25.00	@

Mineral Rubber

Genasco (factory)	ton	50.00	@52.00
Gilsonite	ton	65.00	@
Hard hydrocarbon	ton	31.00	@42.00
Liquid rubber	lb.	.15	@
Ohmlac Kapak, K-R	ton	50.00	@60.00
K-4	ton	175.00	@
Parra M. R. flux	lb	.06	@
Soft hydrocarbon	ton	30.00	@40.00
320/340 M. P. hydrocarbon	ton	45.00	@50.00
300/310 M. P. hydrocarbon	ton	40.00	@45.00
Pioneer. M. R., solid (fac.)	ton	42.00	@44.00
M. R. granular	ton	36.00	@54.00
Robertson, M. R., solid	ton	35.00	@75.00
M. R. granular (factory)	ton	42.00	@80.00
Rubrax (factory)	ton	60.00	@
Synpro, gran. M. R. (fac.)	ton	55.00	@

Oils

Avoilas compound	lb.	.13	@
Castor, No. 1, U. S. P.	lb.	.14	@
No. 3, U. S. P.	lb.	.13½	@
Corn	lb.	.11½	@
Cotton	lb.	.10½	@
Cycline	gal.	.35	@
Glycerine	lb.	.17	@ .17½
Linseed, raw	gal.	.93	@
Palm lagos	lb.	.06⅞	@ .07
Palm, niger	lb.	.09	@
Peanut, crude	lb.	.12	@
refined	lb.	.14	@
Petrolatum, standard	lb.	.06	@ .08
Petrolatum, sticky	lb.	.08	@ .10
Pine, steam distilled	gal.	.65	@ .68
Rapeseed, refined	gal.	.76	@ .82
blown	gal.	.96	@
Rosin	gal.	.45	@ .50
Synpro	gal.		@
Soya bean	lb.	.12	@
Tar	gal.	.26	@ .28
Woburn	lb.	.04½	@

Resins and Pitches

Tar, pine, retort	bbl.	$11.50	@12.00
kiln	bbl.	12.00	@12.50
Pitch, Burgundy	lb.	.05	@
coal tar	lb.	.04¼	@
Fluxol hardwood	ton	60.00	@
pine tar	lb.	.03	@
ponto	lb.	.08	@
Rosin, K (bbl.)	280 lbs.	6.40	@
strained (bbl.)	280 lbs.	6.25	@
Shellac, fine orange	lb.	*.90	@
substitute	gal.	1.50	@

Solvents

Acetone (98.99% drums [6.62 lbs. per gal.])	lb.	*.25	@
Benzol (90% drums [7.21 lbs. per gal.])	gal.		@
pure (drums)	gal.	.42	@
Carbon bisulphide (dms. [10.81 lbs. per gal.])	lb.	.06	@ .07
tetrachloride (drums, [13.28 lbs. per gal.])	lb.	.10½	@ .16
Motor gasoline (steel bbls.)	gal.	.19½	@
Naphtha, V. M. & P.	gal.	.18½	@
solvent (drums extra)	gal.	.28	@
59@61	gal.	.135	@
63@66	gal.	.155	@
66@68	gal.	.17	@
Cymene (factory)	gal.	1.50	@
Toluol, pure (7.21 lbs. per gal.)	gal.		@
Turpentine, spirits	gal.	.97	@
wood, steam distilled	gal.	.87	@

Substitutes

Black	lb.	.09	@ .14
Brown	lb.	.10	@ .15
White	lb.	.10	@ .16
Brown factice	lb.	.09½	@ .13
White factice	lb.	.08½	@ .15
T. K., various	lb.	.14	@ .18

Vulcanizing Ingredients

Black hypo, T. K., S. F.	lb.	.22	@
13% F. S., L. H. B.	lb.	.21	@ .22
Sulphur chloride	lb.	.04	@ .13½
Sulphur, Bergenport brand, 100% pure (bbls.)	cwt.	2.70	@ 3.30
(bags)	cwt.	2.45	@ 3.05
Sulphur, Bklyn bd. (bbls.)	cwt.	2.75	@ 3.30
superfine com. (bgs.)	cwt.	2.00	@ 2.50
(bbls.)	cwt.	2.40	@ 2.90

(See also Colors—Antimony)

Waxes

Wax, beeswax, white, com	lb.	.45	@
ceresine, white	lb.	.12	@
carnauba	lb.	.20	@
montan	lb.	.05	@ .05¼
ozokerite, black	lb.	.18	@
green	lb.	.27	@ .28
paraffine	lb.	.02¾	@ .05
sweet wax	lb.	.10	@ .12

Exhibitions and Conventions

Exhibitions

Sept. 1-7—Chicago, Illinois. Transportation Exhibition; Coliseum.

Sept. 3-8—Indianapolis, Indiana. Annual fall automobile and accessory show of the Indianapolis Automobile Trade Association; Auto Building, State Fair grounds; William Jones, manager.

Sept. 3-8—Sacramento, California. Annual automobile show of Motor Dealers' Association; State Exposition grounds; H. W. Leonard, manager.

Sept. 27—Fresno, California. Race, American Automobile Association.

Sept. 28-30—Memphis, Tennessee. Annual automobile show of Automobile Dealers' Association.

Sept. 28-Oct. 5—Fresno, California. Automobile show of Fresno Automobile Dealers' Association; District Fair; Ray W. Wakefield, manager.

Sept. 29-Oct. 6—New York, N. Y. Annual closed car show of Automobile Merchants' Association; Grand Central Palace.

Oct. 1-6—Salt Lake City, Utah. Automobile show; Utah State Fair grounds; Carl L. Snow, manager.

Oct. 20-28—Washington, D. C. Annual fall show of Washington Automotive Trades Association.

Nov. 4-10—New York, N. Y. First importers' show of Foreign Automotive Association; Hotel Astor.

Nov. 11-17—New York, N. Y. Nineteenth Annual Automobile Salon; Hotel Commodore.

Nov. 12-17—Chicago, Illinois. Annual business exhibit and convention of Automotive Equipment Association; Coliseum.

Jan. 5-12—New York, N. Y. Twenty-fourth Annual New York Automobile Show; Eighth Coast Artillery Armory.

Jan. 26-Feb. 2—Chicago, Illinois. Annual Automobile Salon; Hotel Drake.

Feb. 11-17—Dallas, Texas. Annual Automobile Show.

Conventions

Sept. 19-21—Boston, Massachusetts. Fall convention of Motor and Accessory Manufacturers' Association.

October—Cleveland, Ohio. Production Meeting, Society of Automotive Engineers.

Oct. 3-5—New York, N. Y. Annual convention, American Manufacturers' Export Association; Waldorf-Astoria.

Nov. 13-15—New York, N. Y. Annual Meeting, National Tire Dealers' Association.

Foreign Exhibitions

Oct. 4-10—Paris, France, Automobile Show; Grand Palais.

Nov. 1-15—Buenos Aires, Argentina. Annual automobile exposition of Automovil Club Argentino.

Nov. 2-10—London, England. Motor car exhibition; Olympia.

Official India Rubber Statistics for the United States

Imports of Crude and Manufactured Rubber

	March, 1922		March, 1923	
	Pounds	Value	Pounds	Value
UNMANUFACTURED—*free*				
Crude rubber				
From France	.....	.....	621,007	$157,190
Netherlands	114,618	$20,430	653,871	202,745
Portugal	745,630	37,456	.....	.....
United Kingdom	4,070,301	727,684	11,817,077	3,969,470
Canada	.....	.....	.....	.....
Central America	266	43	5,616	1,186
Mexico	6,171	732	56,010	11,202
Brazil	1,610,341	169,385	2,714,687	720,803
Peru	.....	.....	671,000	80,926
Other South America	357,666	78,256	90,349	26,010
British East Indies	45,671,036	8,043,271	44,879,669	12,033,735
Dutch East Indies	11,636,762	1,921,438	6,747,211	1,612,395
Other countries	2,431	345	1,024,209	225,903
Totals	64,215,222	$10,999,040	69,280,706	$19,041,565
Balata	68,423	36,769	159,317	110,406
Jelutong (Pontianak)	878,323	53,649	1,268,591	110,486
Gutta percha	274,693	37,575	195,289	47,826
Rubber scrap	320,668	46,850	2,209,752	131,417
Totals, unmanufactured	65,757,329	$11,173,883	73,113,655	$19,441,700
Chicle ...*dutiable*	856,302	432,489	.....	.....
MANUFACTURED—*dutiable*				
Rubber belting	.....	.....	79,440	59,238
Other manufactures of, and substitutes for rubber	.....	212,778	.....	98,553

Exports of Domestic Merchandise

MANUFACTURED				
India rubber				
Reclaimed	137,589	$13,512	445,453	$43,683
Scrap and old	1,018,885	52,728	1,743,763	72,388
Footwear				
Boots[1] ...*pairs*	16,117	43,297	20,990	62,419
Shoes[1] ...*pairs*	50,733	44,956	57,942	47,675
Canvas shoes with rubber soles[1] ...*pairs*	238,134	193,208	598,928	449,472
Druggists' rubber sundries[1]	106,562	114,750	85,896	75,611
Hard rubber goods				
Battery jars and accessories[1]	55,605	12,885	29,544	10,227
Other electrical supplies[1]	11,463	7,587	110,636	23,983
Other hard rubber goods[1]	47,543	34,807	42,435	34,811
Tires				
Pneumatic casings				
For automobiles[1]	150,651	1,907,647	190,468	2,017,424
Others[1]	4,429	22,406	8,881	35,899
Pneumatic tubes				
For automobiles[1]	94,232	202,811	134,141	221,429
Others[1]	4,144	5,855	9,389	7,347
Solid tires				
For automobiles and motor trucks[1]	5,043	134,691	10,576	257,251
Others[1]	80,891	21,575	180,078	38,958
All other tires[1]	.....	.....	.....	.....
Tire repair materials[1]	67,602	32,394	77,309	33,988
Belting[1]	174,803	83,345	333,497	168,411
Hose[1]	246,186	104,682	467,846	181,259
Packing[1]	105,833	50,119	115,327	59,934
Soles and heels[1]	106,649	53,399	199,720	68,806
Thread[1]	107,068	129,597	79,788	81,837
Other rubber manufactures[1]	377,011	258,534	549,297	323,364
Totals, manufactured	.....	$3,524,785	.....	$4,316,176

Exports of Foreign Merchandise

UNMANUFACTURED				
India rubber	1,469,492	$226,088	2,494,344	$764,672
Balata	66,700	40,561	18,529	11,451
Gutta percha, rubber substitutes and scrap	4,000	583	152	214
Totals, unmanufactured	1,540,192	$267,232	2,513,025	$776,337
MANUFACTURED				
Gutta percha and india rubber	.....	379	152	214
Totals, manufactured	.....	$379	.....	$214

[1] Details of exports of domestic merchandise by countries during March, 1923, appeared on pages 612-615 of our June, 1923, issue.

Imports of Crude Rubber Into the United States by Customs Districts

	June, 1922		June, 1923	
	Pounds	Value	Pounds	Value
Massachusetts	348,225	$41,854	2,321,196	$722,325
New York	48,211,564	7,023,176	71,140,957	21,232,509
Philadelphia	.....	.....	929,100	422,807
Maryland	807,798	129,822	784,075	273,072
Los Angeles	945,209	142,134	2,715,452	878,978
San Francisco	23,585	3,781	543,489	177,568
Oregon	368,843	56,020	11,270	3,887
Washington	.....	.....	44,820	14,582
Colorado	156,800	25,327	698,352	216,209
Totals	50,952,024	$7,422,114	79,188,711	$23,941,937

Custom House Statistics

New York

Imports of Crude and Manufactured Rubber

	March, 1922		March, 1923	
	Pounds	Value	Pounds	Value
UNMANUFACTURED—*free*				
Crude rubber				
From Belgium	2,325	$326	111,917	$18,019
France	.....	.....	621,007	157,190
Germany	.....	.....	548,219	109,392
Netherlands	114,618	20,430	653,871	202,745
Portugal	745,630	37,456	.....	.....
England	4,059,075	725,456	10,113,191	3,351,686
Guatemala	266	43	.....	.....
Mexico	6,171	732	.....	.....
Nicaragua	.....	.....	5,616	1,186
British West Indies	106	19	.....	.....
Bolivia	11,520	5,424	21,950	13,378
Brazil	1,610,341	169,385	2,714,687	720,803
Colombia	7,996	1,896	28,644	5,468
Ecuador	29,002	5,668	38,487	6,014
Peru	.....	.....	671,000	80,926
Uruguay	309,148	65,268	1,268	1,150
British India	217,224	36,896	169,959	33,852
Ceylon	5,918,563	1,049,574	8,481,340	2,577,634
Straits Settlements	36,926,497	6,513,376	33,979,584	8,776,555
Java	5,963,637	880,264	2,927,414	629,802
Dutch East Indies	5,673,125	1,041,174	3,730,046	962,761
Japan	.....	.....	224,000	56,560
Philippine Islands	.....	.....	21,120	4,224
Turkey in Asia	.....	.....	3,400	983
Totals	61,595,244	$10,553,387	65,066,720	$17,710,728
Balata	68,423	36,769	159,317	110,406
Jelutong (Pontianak)	878,323	53,649	1,256,666	108,784
Gutta percha	274,693	37,575	172,639	40,540
Rubber scrap and reclaimed	65,826	2,067	1,558,100	90,227
Totals, unmanufactured	62,882,509	$10,683,447	68,213,442	$18,060,285
Chicle	505,881	$268,481	833,823	$437,345
MANUFACTURED—*dutiable*				
Rubber belting for machinery	.....	.....	14,305	11,734
Other manufactures of rubber and substitutes	.....	130,320	.....	76,972
Totals, manufactured	.....	$130,320	14,305	$88,706

Exports of Domestic Merchandise

MANUFACTURED				
India rubber				
Reclaimed	9,709	$1,272	65,054	$8,970
Scrap and old	801,700	47,572	963,974	56,732
Footwear				
Boots ...*pairs*	8,963	21,697	11,446	32,108
Shoes ...*pairs*	36,493	31,558	49,969	42,233
Canvas shoes with rubber soles ...*pairs*	143,524	116,125	444,569	325,146
Druggists' rubber sundries	89,924	83,601	53,467	51,522
Hard rubber goods				
Battery jars and accessories	3,283	1,688	16,593	3,067
Other electrical supplies	7,593	4,922	98,514	17,438
Other hard rubber goods	22,497	15,450	30,807	23,227
Tires				
Pneumatic casings				
For automobiles	120,542	1,511,817	155,718	1,622,207
Others	3,912	20,507	7,639	29,880
Pneumatic tubes				
For automobiles	74,336	162,528	107,069	175,059
Others	3,682	5,184	8,438	6,198
Solid tires				
For automobile and motor trucks	3,457	91,004	6,875	170,417
Others	68,067	17,250	93,995	21,824
Tire repair materials	52,005	25,129	51,356	25,195
Belting	81,083	42,442	226,379	112,231
Hose	112,020	47,538	274,319	102,195
Packing	65,086	28,507	69,256	39,863
Soles and heels	82,204	42,879	128,528	48,157
Thread	45,450	59,469	78,111	79,867
Other rubber manufactures	167,328	148,510	260,793	177,428
Totals, manufactured	2,002,858	$2,526,649	3,202,869	$3,170,964

Exports of Foreign Merchandise

UNMANUFACTURED				
Crude rubber	1,659	$477	23,576	$13,284
Balata	65,780	39,899	18,033	11,010
Gutta percha	.....	.....	98	100
Totals, unmanufactured	67,439	$40,376	41,707	$24,394
MANUFACTURED				
Rubber manufactures	18	.....	.....	.....
Rubber substitutes	300	.....	.....	.....
Totals, manufactured	318	.....	.....	.....

Crude Rubber Arrivals at New York as Reported by Importers

Parás and Caucho

	Fine	Medium	Coarse	Caucho	Cametá
JULY 25. By "Polycarp," Pará, Manáos and Iquitos.					
H. A. Astlett & Co.	23,890	.....	19,600	9,678	.....
H. A. Astlett & Co.	‡44,500	.....	‡23,100	.....	.....
General Rubber Co.	44,800	.....	1,400	.....	.....
Poel & Kelly, Inc.	11,642	.....	.....	.....	.....
Ultramares Corp.	4,600	.....	330	390	.....
AUGUST 1. By "Boswell," Pará.					
Paul Bertuch	.....	624	13,357	19,371	.....
JULY 28. By "Sallust," Pará and Manáos.					
H. A. Astlett & Co.	.....	.....	4,600	.....	.....
Paul Bertuch	52,106	.....	6,938	18,064	.....
General Rubber Co.	134,400	.....	4,480	.....	.....
L. Littlejohn & Co., Inc.	22,400	.....	.....	.....	.....
Poel & Kelly, Inc.	44,317	1,400	9,720	9,048	.....
AUGUST 13. By "Benedict," Manáos.					
General Rubber Co.	.....	.....	21,812	34,061	.....
L. Littlejohn & Co., Inc.	67,200	.....	.....	.....	.....
Poel & Kelly, Inc.	11,200	.....	.....	.....	.....

‡ Washed and dried in Brazil.

Plantations

JULY 9. By "Havre Maru," Singapore.

	POUNDS
H. Muehlstein & Co., Inc.	22,400
JULY 12. By "Atreus," Far East.	
H. Muehlstein & Co., Inc.	168,000
William H. Stiles & Co.	224,000
JULY 14. By "City of Hankow," Far East.	
William H. Stiles & Co.	11,200
JULY 20. By "Djambi," Far East.	
Baird Rubber & Trading Co.	33,000
General Rubber Co.	351,680
F. R. Henderson & Co., Inc.	139,800
L. Littlejohn & Co., Inc.	896,000
Meyer & Brown, Inc.	103,040
H. Muehlstein & Co., Inc.	62,720
Poel & Kelly, Inc.	19,312
Fred. Stern & Co., Inc.	134,175
William H. Stiles & Co.	22,400
Chas. T. Wilson Co., Inc.	44,800
JULY 21. By "Muncaster Castle," Far East.	
H. A. Astlett & Co.	22,400
Baird Rubber & Trading Co.	89,600
General Rubber Co.	622,700
F. R. Henderson & Co., Inc.	251,380
Hood Rubber Co.	112,100
L. Littlejohn & Co., Inc.	508,480
Meyer & Brown, Inc.	134,400
H. Muehlstein & Co., Inc.	123,200
Poel & Kelly, Inc.	354,823
William H. Stiles & Co.	89,600
Chas. T. Wilson Co., Inc	64,960
JULY 22. By "Atlanta City," Far East.	
H. A. Astlett & Co.	56,000
General Rubber Co.	98,560
F. R. Henderson & Co., Inc.	642,100
Hood Rubber Co.	*22,346
L. Littlejohn & Co., Inc.	470,400
Meyer & Brown, Inc.	160,160
H. Muehlstein & Co., Inc.	235,200
Poel & Kelly, Inc.	112,767
Fred. Stern & Co., Inc.	4,480
William H. Stiles & Co.	44,800
Chas. T. Wilson Co., Inc.	78,400
JULY 23. By "Eurylochus," Far East.	
H. A. Astlett & Co.	212,800
Baird Rubber & Trading Co.	67,200
General Rubber Co.	579,570
F. R. Henderson & Co., Inc.	44,800
Hood Rubber Co.	*44,800
J. T. Johnstone & Co., Inc.	243,936
L. Littlejohn & Co., Inc.	1,132,400
Meyer & Brown, Inc.	604,800
H. Muehlstein & Co., Inc.	145,600
Poel & Kelly, Inc.	546,449
Fred. Stern & Co., Inc.	112,000
William H. Stiles & Co.	16,800
Chas. T. Wilson Co., Inc.	283,100
Chas. T. Wilson Co., Inc.	*17,920
JULY 25. By "Bessemer City," Singapore.	
H. Muehlstein & Co., Inc.	56,000
JULY 30. By "The Lambs," Singapore.	
H. A. Astlett & Co.	44,800
Baird Rubber & Trading Co.	44,800
General Rubber Co.	157,500
F. R. Henderson & Co., Inc.	87,600
L. Littlejohn & Co., Inc.	725,760
H. Muehlstein & Co., Inc.	67,200
Meyer & Brown, Inc.	168,000
Poel & Kelly, Inc.	338,729

*Arrived at Boston.

	POUNDS
Fred. Stern & Co., Inc.	137,000
William H. Stiles & Co.	56,000
Chas. T. Wilson Co., Inc.	78,400
AUGUST 1. By "Clan Matheson," Far East.	
General Rubber Co.	4,480
Hood Rubber Co.	*89,700
L. Littlejohn & Co., Inc.	53,760
Poel & Kelly, Inc.	100,800
Fred. Stern & Co., Inc.	22,400
Chas. T. Wilson Co., Inc.	268,800
AUGUST 2. By "Dacre Castle," Far East.	
Baird Rubber & Trading Co.	22,400
General Rubber Co.	607,240
F. R. Henderson Co., Inc.	56,000
Hood Rubber Co.	11,246
L. Littlejohn & Co., Inc.	694,400
Meyer & Brown, Inc.	338,800
H. Muehlstein & Co., Inc.	100,800
Poel & Kelly, Inc.	870,786
Fred. Stern & Co., Inc.	17,636
Chas. T. Wilson Co., Inc.	114,800
Chas. T. Wilson Co., Inc.	*47,040
AUGUST 3. By "City of Oran," Far East.	
Baird Rubber & Trading Co.	112,000
General Rubber Co.	22,400
L. Littlejohn & Co., Inc.	112,000
Poel & Kelly, Inc.	56,000
AUGUST 8. By "Keelung," Far East.	
Hood Rubber Co.	*44,910
AUGUST 11. By "Yamagata Maru," Colombo.	
Poel & Kelly, Inc.	36,500
AUGUST 13. By "City of Birmingham," Far East.	
H. A. Astlett & Co.	224,000
Baird Rubber & Trading Co.	291,200
General Rubber Co.	201,600
F. R. Henderson & Co., Inc.	51,470
Hood Rubber Co.	*190,580
J. T. Johnstone & Co., Inc.	147,840
L. Littlejohn & Co., Inc.	851,200
Meyer & Brown, Inc.	302,400
H. Muehlstein & Co., Inc.	324,800
Poel & Kelly, Inc.	563,080
Fred. Stern & Co., Inc.	29,120
William H. Stiles & Co.	168,000
Chas. T. Wilson Co., Inc.	235,200
Chas. T. Wilson Co., Inc.	*22,400
AUGUST 13. By "Eastern Prince," Far East.	
H. A. Astlett & Co.	67,200
H. A. Astlett & Co.	*22,400
Baird Rubber & Trading Co.	145,600
General Rubber Co.	498,773
F. R. Henderson & Co., Inc.	102,000
Hood Rubber Co.	67,200
Hood Rubber Co.	*60,374
J. T. Johnstone & Co., Inc.	73,920
Chas. T. Wilson Co., Inc.	44,800
L. Littlejohn & Co., Inc.	777,280
Meyer & Brown, Inc.	672,000
H. Muehlstein & Co., Inc.	208,320
Poel & Kelly, Inc.	1,229,442
Fred. Stern & Co., Inc.	180,087
William H. Stiles & Co.	212,800
AUGUST 15. By "Diana Dollar," Far East.	
Baird Rubber & Trading Co.	22,400
F. R. Henderson & Co., Inc.	56,880
Hood Rubber Co.	*33,600
L. Littlejohn & Co., Inc.	358,400
Meyer & Brown, Inc.	1,120
H. Muehlstein & Co., Inc.	78,400
Fred. Stern & Co., Inc.	101,549
Chas. T. Wilson Co., Inc.	11,200

	POUNDS
AUGUST 15. By "President Van Buren," London.	
General Rubber Co.	457,200
AUGUST 16. By "City of Pittsburg," Far East.	
Baird Rubber & Trading Co.	280,000
Hood Rubber Co.	*291,630
J. T. Johnstone & Co., Inc.	147,840
L. Littlejohn & Co., Inc.	548,800
Fred. Stern & Co., Inc.	108,040
Chas. T. Wilson Co., Inc.	154,560
AUGUST 18. By "Oanfa," Singapore.	
General Rubber Co.	94,000
J. T. Johnstone & Co., Inc.	24,640
L. Littlejohn & Co., Inc.	448,000

Balata

JULY 18. By "Surinam," French Guiana.

Middletown & Co., Ltd.	16,654
JULY 25. By "Polycarp," Iquitos.	
H. A. Astlett & Co.	65,900
L. Littlejohn & Co., Inc.	4,500
JULY 28. By "Sallust," Manáos.	
Paul Bertuch	4,414
AUGUST 13. By "Benedict," Manáos.	
Paul Bertuch	4,497

Africans

AUGUST 7. By "Celtic," Liverpool.

Fred. Stern & Co., Inc.	10,310
AUGUST 13. By "Orbita," Hamburg.	
Poel & Kelly, Inc.	33,600

Centrals

JULY 24. By "Colombia," Corinto.

Ultramares Corp.	1,280
AUGUST 8. By "General Georgas," Colon and Tumaco.	
Ultramares Corp.	3,125
AUGUST 13. By "Benedict," Manáos.	
Paul Bertuch	51
AUGUST 13. By "Eastern Prince," Singapore.	
L. Littlejohn & Co., Inc.	70,000

Gutta Siak

JULY 21. By "Muncaster Castle," Singapore.

L. Littlejohn & Co., Inc.	100,800
JULY 23. By "Furylochus," Singapore.	
F. R. Henderson & Co., Inc.	56,000
L. Littlejohn & Co., Inc.	56,000
AUGUST 2. By "Dacre Castle," Singapore.	
L. Littlejohn & Co., Inc.	56,000
AUGUST 13. By "Eastern Prince," Singapore.	
L. Littlejohn & Co., Inc.	56,000
AUGUST 16. By "City of Pittsburg," Singapore.	
L. Littlejohn & Co., Inc.	56,000

Pontianak

JULY 20. By "Djambi," Java.

L. Littlejohn & Co., Inc.	56,000
JULY 22. By "Atlanta City," Far East.	
F. R. Henderson & Co., Inc.	146,640
JULY 23. By "Eurylochus," Singapore.	
F. R. Henderson & Co., Inc.	28,500
AUGUST 2. By "Dacre Castle," Singapore.	
L. Littlejohn & Co., Inc.	60,000
AUGUST 13. By "City of Birmingham," Singapore.	
L. Littlejohn & Co., Inc.	30,000
AUGUST 15. By "Diana Dollar," Far East.	
F. R. Henderson & Co., Inc.	144,500
AUGUST 18. By "Oanfa," Singapore.	
L. Littlejohn & Co., Inc.	45,000

Guayule

JULY 28-AUGUST 18. By "Railways," Mexico.

Continental Rubber Co.	368,000

Exports of India Rubber Manufactures from the

EXPORTED TO	Belting Value	Hose Value	Packing Value	Thread Value	Boots Pairs	Boots Value	Shoes Pairs	Shoes Value	Canvas Shoes with Rubber Soles Pairs	Canvas Shoes with Rubber Soles Value	Soles and Heels Value	Leather Cloth or Artificial Leather Value	Waterproofed Auto Cloth Value
EUROPE													
Austria							600	$508					
Belgium	$4,740	$798	$1,317	$5,061			672	303	234	$238	$40	$776	$5,602
Czechoslovakia													
Denmark			275		84	$241	2,640	1,781				7,275	
Esthonia													
Finland	1,711											180	77
France	3,591	477	1,000	11,526					2,159	1,322	68	83,379	639
Germany													
Greece													
Hungary													
Iceland and Faroe Islands					336	957	325	280					
Italy	143			3,075	1,152	3,561					300	630	
Latvia													
Lithuania													
Malta, Gozo, and Cyprus Islands													412
Netherlands		802									1,733		952
Norway	566	1,412			984	2,586	539	709	384	383	484	1,097	470
Poland and Danzig													
Portugal		304							72	85	116	1,477	
Rumania		524											
Russia in Europe			483										
Spain							290	205			19	10,370	374
Sweden	462	542									773	16,969	241
Switzerland	96				49	260	6	7	3	10			
Turkey in Europe					88	186							
Ukraine													
England	14,452	20,218	5,735	45,828	2,082	5,297	8,352	4,165	932	1,116	639	14,559	8,881
Scotland	503	290	266		1,340	2,162	720	329				5,271	82
Ireland		69										687	
TOTALS, EUROPE	$26,264	$25,436	$9,076	$65,490	6,115	$15,250	14,144	$8,278	3,784	$3,154	$4,172	$142,670	$17,730
NORTH AMERICA													
Canada—Maritime Provinces	$207	$887	$65		574	$2,014	140	$128	1,122	$896	$115	$634	
Quebec and Ontario	7,353	10,568	6,329	$6,772	645	2,228	3,073	7,113	3,573	3,377	1,587	15,010	$21,678
Prairie Provinces	138	266	109				45	138	2,699	2,200		572	141
Brit. Columbia and Yukon	5,243	1,179	517		895	3,818	944	2,664	964	1,080		295	184
British Honduras			86						272	232	22		
Costa Rica	123	738	135						24	18	1,490	145	1,163
Guatemala	645	468	56						24	62	1,231	462	
Honduras	1,081	3,590	154						885	974	507		756
Nicaragua	541	636	15				23	14	529	518	480	37	
Panama	83	1,487	281				1,029	1,245	3,817	4,240	281	318	660
Salvador		158		118			48	37	425	456	3,319	75	
Mexico	18,124	27,281	9,143	11,802	32	132	138	454	38,012	33,782	7,717	2,618	2,152
Miquelon and St. Pierre Islands					348	956							
Newfoundland and Labrador	173	851			4,363	12,248	615	783	1,801	1,277	466		
Bermuda		14			12	36	32	24	572	528	118		17
Barbados		24							11	10			
Jamaica	28	100	45						2,151	1,774	349	327	678
Trinidad and Tobago		560	1,041						2,272	1,846	54		198
Other British West Indies	3,956	1,168	130				72	53	3,437	3,180	39		88
Cuba	3,536	13,573	10,387		24	96	6,737	3,938	79,806	49,418	10,363	8,942	5,851
Dominican Republic		373	160						1,554	1,360	736	394	110
Dutch West Indies	18	151			36	126	320	228	7,567	5,631	298		
French West Indies												124	
Haiti	66	128							348	426	40		
Virgin Islands of United States									490	622	445		
TOTALS, NORTH AMERICA	$41,315	$64,200	$28,657	$18,692	6,929	$21,654	13,221	$16,819	152,355	$113,901	$29,657	$29,953	$33,676
SOUTH AMERICA													
Argentina	$13,398	$20,501	$352		2,780	$7,195			31,516	$27,961	$1,282	$7,399	$13,323
Bolivia	416												
Brazil	4,660	3,581	766		60	162	2,500	$1,579				2,827	2,372
Chile	5,818	6,130	3,333		96	269			815	552	262	6,319	778
Colombia	3,183	3,114	1,577				72	43	1,048	1,040	3,446	645	215
Ecuador		216	444						1,068	701	185		
British Guiana	519	60	138						2,163	1,576			
Dutch Guiana	29								528	530			
Paraguay													
Peru	3,492	4,857	285		334	1,982			768	1,136	142	464	110
Uruguay	300	471	147				5,010	4,454	29,282	24,116	1,155	694	153
Venezuela	452	615	1,130						96	75	1,475	2,304	517
TOTALS SOUTH AMERICA	$37,267	$39,485	$8,172		3,270	$9,608	7,582	$6,076	67,284	$57,687	$7,947	$20,652	$17,468
ASIA													
Aden													
British India	$169	$1,845					264	$234	1,311	$1,490		$13,814	$774
Ceylon	731	209	$112						384	325			
Straits Settlements	366	30					236	154	1,430	1,202	75	361	959
China	1,168	491	1,284						2,560	2,685		3,170	3,411
Chosen													
Java and Madura	4,097	309	274						186	244	627		3,638
Other Dutch East Indies												708	
French Indo-China	3,253		45						144	169			
Hejaz, Arabia, etc.													
Hongkong		68	1,055	$365					216	220	348	252	96
Japan	632	5,276	8,475	21,588	8,864	$23,037	7,716	6,342				3,568	517
Kwangtung, leased territory			1,847				4,752	4,139					
Palestine and Syria	41												319
Philippine Islands	4,146	3,371	657		6	34			98,947	68,880	7,082	3,696	2,000
Siam							200	175	192	147			131
TOTALS, ASIA	$14,597	$11,599	$13,749	$21,953	8,870	$23,071	13,168	$11,044	105,370	$74,762	$8,132	$25,569	$11,845

United States by Countries During June, 1923

Water-proofed Clothing Value	Pneumatic Casings: Automobile Number	Pneumatic Casings: Automobile Value	Pneumatic Casings: Others Value	Solid Tires: Automobile and Motor Truck Value	Solid Tires: Others Value	Pneumatic Tubes: Automobile Number	Pneumatic Tubes: Automobile Value	Pneumatic Tubes: Others Value	Tire Repair Materials Value	Druggists' Rubber Sundries Value	Hard Rubber Goods: Battery Jars and Accessories Value	Hard Rubber Goods: Other Electrical Supplies Value	Hard Rubber Goods: Others Value	Scrap and Old Value	All Other Rubber Manufactures Value
.....	198	$2,875	.....	.....	.....	70	$141	.....	.....	.....	.....	.....	.....	$1,898	.....
.....	206	3,111	.....	.....	.....	391	536	$16	$742	$1,448	.....	.....	.....	.....	$3,547
.....	290	4,972	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	905	13,305	.....	$95	.....	508	944	.....	1,499	888	.....	.....	.....	.....	3,882
.....	224	3,089	.....	.....	.....	204	361	.....	.....	.....	.....	.....	.....	.....	.....
.....	378	5,124	.....	316	.....	386	672	.....	.....	.....	.....	.....	.....	.....	588
$145	640	9,321	.....	1,406	.....	260	569	.....	4,907	2,712	.....	.....	$4,231	10,402	10,556
.....	1,346	20,793	.....	509	.....	1,389	2,829	.....	499	.....	.....	.....	.....	8,878	606
.....	967	14,026	$36	3,546	$900	1,282	2,478	6	.....	.....	.....	.....	.....	84	.....
.....	250	3,555	.....	.....	.....	256	337	.....	10	.....	.....	.....	.....	.....	.....
.....	14	165	.....	.....	.....	15	25	.....	.....	.....	.....	$215	.....	.....	.....
25	2,002	24,924	5,567	.....	.....	997	1,830	1,128	193	532	.....	.....	.....	475	165
.....	94	1,245	.....	.....	.....	240	453	.....	.....	.....	.....	.....	.....	.....	.....
.....	200	2,308	.....	.....	.....	400	639	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1,080	1,234	17,551	921	1,972	.....	1,366	2,020	249	172	151	.....	.....	.....	561	3,437
43	372	3,778	43	3,384	.....	525	1,482	.....	115	.....	$128	.....	194	.....	529
.....	112	1,035	.....	.....	.....	302	530	.....	2	.....	.....	.....	.....	.....	.....
.....	587	6,564	.....	.....	.....	282	479	.....	5	.....	.....	.....	.....	.....	1,382
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,154	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	1,839	28,977	79	4,811	.....	1,738	3,034	160	950	.....	.....	.....	.....	23,063	581
.....	8,925	110,055	158	1,465	.....	6,002	9,609	17	181	.....	46	.....	.....	.....	400
30	767	10,978	190	.....	.....	678	1,541	75	.....	.....	.....	.....	.....	.....	21
.....	125	1,706	.....	415	.....	95	168	.....	78	.....	.....	.....	.....	.....	.....
.....	25	734	.....	.....	.....	40	117	.....	.....	.....	.....	.....	.....	.....	.....
.....	45,055	380,231	2,702	46,793	.....	31,445	41,845	185	1,190	19,261	100	.....	22,045	1,650	62,267
.....	62	1,435	.....	.....	.....	47	136	.....	1,700	523	.....	.....	.....	6,099	1,325
.....	1,409	13,593	.....	.....	.....	1,283	1,800	.....	.....	.....	.....	.....	.....	.....	400
$1,323	68,226	$685,450	$9,696	$64,712	$900	50,201	$74,575	$1,836	$12,243	$25,515	$274	$215	$27,624	$53,110	$89,686
$193	41	$689	$7	.....	.....	130	$898	.....	.....	$26	$67	.....	$90	.....	$1,379
2,840	6,813	87,207	97	$3,110	$952	3,497	7,470	$72	$3,200	7,568	2,708	$3,404	12,593	$7,746	75,729
12	4,598	45,275	10	661	.....	639	1,049	.....	271	1,593	126	47	614	.....	10,471
582	74	1,028	29	1,641	.....	40	69	.....	.....	37	6	.....	90	.....	2,578
.....	31	189	.....	.....	.....	24	50	.....	11	.....	.....	.....	.....	.....	2
472	14	177	.....	78	.....	8	20	.....	29	.....	.....	.....	.....	.....	877
3,250	97	1,748	16	.....	.....	257	437	3	26	55	.....	.....	.....	.....	726
21	52	1,923	.....	1,599	.....	34	101	.....	.....	198	.....	63	14	.....	419
39	39	648	.....	.....	.....	89	158	.....	.....	.....	25	.....	.....	.....	423
404	298	3,702	201	1,034	80	562	917	404	382	116	227	175	81	.....	3,265
.....	14	280	.....	.....	.....	12	39	.....	.....	100	.....	.....	.....	.....	28
7,978	6,629	73,377	3,290	1,935	4,310	4,111	8,606	766	580	1,882	.....	466	1,620	.....	16,671
156	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
7,593	180	3,159	.....	.....	489	243	422	.....	144	90	.....	111	134	.....	1,763
67	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	104
.....	29	280	.....	.....	.....	44	125	.....	9	33	.....	.....	.....	.....	72
39	623	7,991	.....	450	.....	1,227	1,916	.....	203	91	.....	.....	.....	.....	1,314
.....	632	8,279	.....	499	.....	1,120	1,871	.....	128	27	.....	.....	.....	.....	1,251
.....	126	1,711	569	.....	.....	369	653	.....	30	.....	.....	.....	157	.....	116
30,527	4,930	57,225	8,371	7,529	.....	10,959	17,632	721	1,311	6,372	.....	9	288	.....	13,219
423	540	5,538	62	1,224	.....	620	1,979	15	99	184	.....	130	.....	.....	1,526
182	33	322	18	.....	.....	107	173	.....	.....	.....	.....	.....	.....	.....	105
.....	272	2,791	.....	155	.....	15	16	.....	.....	.....	.....	.....	.....	.....	348
.....	94	1,188	17	.....	.....	252	458	5	27	.....	.....	2	.....	.....	.....
.....	28	445	.....	.....	.....	36	59	.....	.....	.....	.....	.....	.....	.....	2
$54,778	26,187	$305,172	$12,787	$19,915	$5,831	24,395	$45,118	$1,986	$6,450	$18,372	$3,159	$4,407	$15,681	$7,746	$132,388
$5,164	8,900	$91,635	$257	$5,397	$3,707	5,476	$12,801	.....	$4,239	$2,465	.....	$1,136	$1,533	.....	$7,460
.....	60	1,300	.....	.....	.....	60	149	.....	.....	.....	.....	335	.....	.....	94
617	1,892	20,564	.....	.....	.....	2,316	5,078	.....	496	1,476	.....	.....	2	.....	1,725
.....	796	10,435	.....	546	729	1,224	2,589	.....	884	807	.....	1,267	.....	.....	1,600
484	732	11,792	.....	1,340	75	935	1,728	.....	532	1,181	.....	.....	.....	.....	1,907
.....	228	3,228	.....	.....	.....	168	332	.....	16	46	.....	.....	.....	.....	563
314	40	542	.....	.....	.....	24	37	.....	.....	.....	.....	.....	.....	.....	139
.....	26	270	.....	.....	.....	28	47	.....	.....	.....	.....	.....	.....	.....	18
162	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
5,523	1,402	19,362	230	1,687	66	1,145	2,338	$25	183	283	.....	.....	156	.....	1,250
2,477	1,787	16,636	.....	494	.....	1,121	1,722	.....	.....	279	.....	.....	142	.....	3,741
.....	1,052	13,550	80	448	251	975	2,056	7	203	1,259	.....	.....	700	.....	1,446
$14,741	16,915	$189,314	$567	$9,912	$4,828	13,472	$28,877	$42	$6,553	$7,796	.....	$2,738	$2,533	.....	$19,943
.....	195	$1,550	.....	.....	.....	98	$137	.....	.....	.....	.....	.....	.....	.....	.....
.....	932	9,641	.....	$3,008	$1,085	412	627	.....	$95	$338	$39	.....	.....	.....	$175
.....	88	847	.....	71	.....	12	27	.....	.....	.....	.....	.....	.....	.....	.....
.....	2,841	24,173	$214	3,236	45	1,299	1,637	$10	11	568	.....	.....	.....	.....	1,349
$11	438	7,260	26	.....	.....	251	425	71	38	3,969	9	$1,000	.....	.....	5,085
.....	48	830	.....	.....	.....	40	32	.....	.....	.....	.....	.....	.....	.....	.....
1,995	1,156	15,718	129	3,098	1,987	1,022	1,896	14	74	355	.....	.....	.....	.....	710
.....	68	781	.....	329	.....	77	140	.....	.....	.....	.....	.....	.....	.....	50
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	169	1,540	.....	.....	.....	36	81	.....	50	.....	.....	.....	.....	.....	.....
.....	645	13,019	.....	2,108	.....	516	966	25	29	315	.....	.....	.....	.....	1,192
.....	1,802	17,445	.....	12,394	.....	.....	.....	.....	.....	2,108	.....	.....	$39	$3,567	9,146
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	521	6,407	.....	49	.....	514	2,367	.....	320	152	20	.....	.....	.....	1,948
2,626	3,193	45,360	1,212	9,465	5,178	3,576	5,601	768	143	1,677	.....	445	.....	.....	2,636
.....	40	460	.....	.....	.....	40	57	.....	.....	125	.....	.....	.....	.....	.....
$4,633	12,136	$145,031	$1,581	$33,758	$8,295	7,893	$13,993	$888	$760	$9,607	$68	$1,445	$39	$3,567	$22,291

Exports of India Rubber Manufactures from the

EXPORTED TO	Belting Value	Hose Value	Packing Value	Thread Value	Boots Pairs	Boots Value	Shoes Pairs	Shoes Value	Canvas Shoes with Rubber Soles Pairs	Canvas Shoes with Rubber Soles Value	Soles and Heels Value	Leather Cloth or Artificial Leather Value	Waterproofed Auto Cloth Value
OCEANIA													
Australia	$13,826	$11,228	$7,024	.....	561	$1,628	468	$198	1,296	$1,187	.....	$35,043	$9,591
British Oceania	.....	.....	.....	.....	.....	.....	.....	.....	606	700	.....	.....	.....
French Oceania	.....	242	.....	.....	24	45	.....	.....	875	939	.....	.....	.....
New Zealand	1,504	666	1,414	.....	653	2,341	100	147	613	657	.....	1,847	322
Other Oceania	.....	.....	.....	.....	.....	.....	.....	.....	668	851	.....	.....	40
TOTALS, OCEANIA	$15,330	$12,136	$8,438	.....	1,238	$4,014	568	$345	4,058	$4,334	.....	$36,890	$9,953
AFRICA													
British West Africa	.....	$75	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
British South Africa	$24,560	16,428	$3,988	.....	1,389	$4,504	2,188	$1,464	3,282	$3,889	$3,866	$5,372	$6,205
British East Africa	1,782	484	1,140	.....	.....	.....	.....	.....	.....	.....	.....	464	.....
Canary Islands	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Egypt	665	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	18,976	.....
Algeria and Tunis	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Other French Africa	.....	.....	.....	.....	72	162	.....	.....	.....	.....	.....	.....	.....
Morocco	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	193
Portuguese East Africa	184	350	.....	.....	.....	.....	.....	.....	.....	.....	.....	85	.....
Other Portuguese Africa	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Spanish Africa	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
TOTALS, AFRICA	$27,191	$17,337	$5,128	.....	1,461	$4,666	2,188	$1,464	3,282	$3,889	$3,866	$24,897	$6,398
GRAND TOTALS	$161,964	$170,193	$73,220	$106,135	27,883	$78,263	50,871	$44,026	336,133	$257,727	$53,774	$280,631	$97,070

United States Crude and Waste Rubber Imports for 1923 (By Months)

	Plantations	Parás	Africans	Centrals	Guayule	Manicoba and Matto Grosso	Total 1923	Total 1922	Balata	Miscellaneous	Waste
January ..... *tons*	29,354	1,233	549	61	.....	.....	31,197	21,867	64	257	382
February	21,815	2,004	308	93	.....	.....	24,220	28,973	25	397	684
March	31,673	1,482	742	19	.....	.....	33,916	28,702	124	738	863
April	29,922	1,095	399	30	142	.....	31,588	14,444	40	1,504	507
May	34,609	1,042	333	24	167	9½	36,184½	20,622	55	463	361
June	31,574	1,032	286	42	.....	.....	32,934	15,750	28	771	300
July	17,459	636	146	23	328	17	18,609	25,245	68	436	121
Totals, 7 months, 1923 *tons*	196,406	8,524	2,763	292	637	26½	208,648½	.....	404	4,566	3,218
Totals, 7 months, 1922	148,564	5,684	912	40	281	122	.....	155,603	172	3,097	337

Compiled from statistics supplied by the Rubber Association of America, Inc.

United Kingdom Statistics

Imports

	June, 1922 Pounds	June, 1922 Value	June, 1923 Pounds	June, 1923 Value
UNMANUFACTURED				
Crude rubber From—				
Straits Settlements	36,557	£128,765	40,343	£245,245
Federated Malay States	36,114	164,444	19,598	115,692
British India	4,616	20,105	3,740	22,657
Ceylon and Dependencies	14,182	55,663	16,109	96,719
Other Dutch Possessions in Indian Seas	4,230	19,445	1,750	9,998
Dutch East Indies (except Other Dutch Possessions in Indian Seas)	10,070	43,043	9,653	58,335
Other countries in East Indies and Pacific not elsewhere specified	1,127	4,414	1,456	8,515
Brazil	2,309	7,829	5,528	29,285
Peru	.....	.....	411	1,736
South and Central America (except Brazil and Peru)	.....	.....	.....	.....
West Africa				
French West Africa	18	60	1,143	4,397
Gold Coast	.....	.....	99	476
Other parts of West Africa	13	33	342	1,366
East Africa, including Madagascar	68	199	329	1,535
Other countries	8	28	757	5,432
Totals	109,312	444,028	101,258	601,388
Waste and reclaimed rubber	271	475	1,800	2,398
Gutta percha and balata	2,452	26,366	6,250	74,989
Rubber substitutes	40	96	10	19
Totals, unmanufactured	112,075	£470,965	109,318	£678,794
MANUFACTURED				
Boots and shoes ..... *doz. pairs*	9,133	£14,847	10,879	£14,585
Tires and tubes				
Pneumatic				
Outer covers	.....	374,669	.....	211,399
Inner tubes	.....	39,852	.....	24,297
Solid tires	.....	15,303	.....	19,196
Other rubber manufactures	.....	85,016	.....	93,859
Totals, manufactured	.....	£529,687	.....	£363,336

Exports

	June, 1922 Pounds	June, 1922 Value	June, 1923 Pounds	June, 1923 Value
UNMANUFACTURED				
Waste and reclaimed rubber	2,539	£3,795	5,860	£4,100
Rubber substitutes	951	2,153	780	1,637
Totals, unmanufactured	3,490	£5,948	6,640	£5,737
MANUFACTURED				
Boots and shoes ..... *doz. pairs*	9,772	£16,199	16,073	£24,906
Tires and tubes				
Pneumatic				
Outer covers	.....	133,712	.....	137,056
Inner tubes	.....	17,794	.....	25,670
Solid tires	.....	31,419	.....	27,304
Other rubber manufactures	.....	221,613	.....	238,098
Totals, manufactured	.....	£420,737	.....	£453,034

Exports—Colonial and Foreign

UNMANUFACTURED				
Crude rubber				
To Russia	360	£3,063	872	£4,748
Sweden, Norway and Denmark	1,935	7,253	608	4,077
Germany	14,403	52,221	13,487	84,070
Belgium	2,431	8,293	1,532	9,171
France	13,994	51,635	26,800	160,340
Spain	462	1,881	174	1,060
Italy	2,589	9,652	7,288	45,039
Austria	672	2,400	.....	.....
Other European countries	3,981	19,282	644	3,795
United States	16,555	61,201	88,610	604,783
Canada	452	1,300	3,270	20,500
Other countries	1,713	8,132	398	2,463
Totals	59,547	£226,313	143,683	£940,046
Waste and reclaimed rubber	81	295	.....	.....
Gutta percha and balata	1,646	21,459	459	6,234
Rubber substitutes	.....	.....	.....	.....
Totals, unmanufactured	61,274	£248,067	144,142	£946,280
MANUFACTURED				
Boots and shoes ..... *doz. pairs*	976	£2,547	147	£296
Tires and tubes				
Pneumatic				
Outer covers	.....	25,281	.....	8,823
Inner tubes	.....	1,878	.....	689
Solid tires	.....	1,766	.....	1,376
Other rubber manufactures	.....	6,333	.....	3,374
Totals, manufactured	.....	£37,805	.....	£14,558

United States by Countries During June, 1923—*Continued*

Waterproofed Clothing Value	Pneumatic Casings: Automobile Number	Pneumatic Casings: Automobile Value	Pneumatic Casings: Others Value	Solid Tires: Automobile and Motor Truck Value	Solid Tires: Others Value	Pneumatic Tubes: Automobile Number	Pneumatic Tubes: Automobile Value	Pneumatic Tubes: Others Value	Tire Repair Materials Value	Druggists' Rubber Sundries Value	Hard Rubber Goods: Battery Jars and Accessories Value	Hard Rubber Goods: Other Electrical Supplies Value	Hard Rubber Goods: Others Value	Scrap and Old Value	All Other Rubber Manufactures Value
.....	9,011	$127,203	$254	$38,852	$772	4,676	$9,430	$23	$2,765	$2,503	$179	$382	$10	.....	$19,009
.....	4	39	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	32	.....	.....
.....	44	586	60	370	109	51	94	21	44	.....	.....	15	.....	.....	.....
.....	7,216	104,091	300	16,902	89	1,981	3,862	209	1,291	127	.....	.....	.....	.....	3,607
$59	122	1,591	116	.....	.....	127	231	19	69	.....	51	.....	30	.....	.....
$59	16,397	$233,510	$730	$56,124	$970	6,835	$13,617	$272	$4,169	$2,630	$230	$397	$72	.....	$22,616
.....	174	$2,827	.....	.....	.....	24	$138	.....	.....	.....	.....	.....	.....	.....	$329
$4,594	3,760	38,904	$131	$1,192	$14	5,628	9,731	$43	$104	$600	.....	.....	.....	.....	3,409
.....	134	1,512	.....	.....	.....	30	45	.....	.....	.....	.....	.....	.....	.....	229
.....	255	2,951	.....	73	.....	130	206	.....	.....	.....	.....	.....	.....	.....	.....
.....	213	2,761	35	.....	.....	248	582	.....	.....	63	.....	.....	.....	.....	.....
.....	116	953	.....	510	.....	601	1,501	.....	175	.....	.....	.....	.....	.....	28
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	19	105	.....	143	.....	14	102	.....	310	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	135	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	24	1,560	.....	.....	.....	10	46	.....	.....	.....	.....	.....	.....	.....	.....
$4,594	4,695	$51,573	$166	$2,053	$14	6,685	$12,351	$43	$589	$663	.....	.....	.....	.....	$3,995
$80,128	144,556	$1,610,050	$25,527	$186,474	$20,838	109,481	$188,531	$5,067	$30,764	$64,583	$3,731	$9,202	$45,949	$64,423	$290,919

Compiled from statistics supplied by the Bureau of Foreign Commerce, Department of Commerce, Washington, D. C.

Rubber Statistics for the Dominion of Canada

Imports of Crude and Manufactured Rubber

	May, 1922 Pounds	May, 1922 Value	May, 1923 Pounds	May, 1923 Value
UNMANUFACTURED—*free*				
Rubber, gutta percha, etc.				
From United Kingdom.....	54,843	$8,630	91,927	$33,013
United States.....	812,101	127,875	1,982,473	603,781
British East Indies....	.....	.....	.....	.....
India	.....	.....	.....	.....
Ceylon	.....	.....	.....	.....
Straits Settlements...	778,400	136,057	576,720	183,801
Dutch East Indies.....	125,813	21,391	112,224	30,851
France	.....	.....	.....	.....
Other countries.....	.....	.....	.....	.....
Totals	1,771,157	$293,953	2,763,344	$851,446
Rubber, recovered.....	192,288	17,646	174,163	15,936
Rubber, powdered, and rubber or gutta percha scrap.....	184,563	7,560	507,097	23,714
Balata	.....	.....	25	40
Rubber substitutes.....	16,450	2,248	173,876	22,444
Totals, unmanufactured.....	2,164,458	$321,407	3,618,505	$913,580
PARTLY MANUFACTURED				
Hard rubber sheets and rods...	2,162	$1,597	13,949	$5,148
Hard rubber tubes.....	.....	2,517	.....	1,910
Rubber thread, not covered.....	8,601	12,322	17,327	20,167
Totals, partly manufactured.	10,763	$16,436	31,276	$27,225
MANUFACTURED				
Belting	.....	$14,739	.....	$11,945
Hose	.....	10,918	.....	13,668
Packing	.....	4,645	.....	4,762
Boots and shoes.....*pairs*	1,010	3,674	3,750	8,970
Clothing, including waterproofed.	.....	11,822	.....	24,886
Gloves	.....	937	.....	1,190
Hot water bottles.....	.....	552	.....	653
Tires, solid.....*number*	.....	20,120	1,470	4,871
Tires, pneumatic.....*number*	.....	116,814	6,052	82,603
Inner tubes.....*number*	.....	16,344	5,470	11,379
Elastic, round or flat.....	.....	32,742	.....	24,889
Mats and matting.....	.....	47	.....	2,381
Cement	.....	4,900	.....	7,297
Other rubber manufactures.....	.....	143,138	.....	159,056
Totals, manufactured.....	.....	$381,392	.....	$358,460
Totals, rubber imports.....	.....	$719,235	.....	$1,299,265

Exports of Domestic and Foreign Rubber Goods

	May, 1922 Produce of Canada Value	May, 1922 Reexports of Foreign Goods Value	May, 1923 Produce of Canada Value	May, 1923 Reexports of Foreign Goods Value
UNMANUFACTURED				
Crude and waste rubber.....	$2,564	.....	$11,296	$11,882
Totals, unmanufactured.....	$2,564	.....	$11,296	$11,882
MANUFACTURED				
Belting	$3,480	.....	$23,976	.....
Canvas shoes with rubber soles..	55,142	.....	74,331	.....
Boots and shoes.....	15,929	.....	26,559	.....
Clothing, including waterproofed	164	.....	1,071	.....
Hose	10,924	.....	5,583	.....
Tires, casings.....	355,506	.....	664,663	.....
inner tubes.....	30,334	.....	58,877	.....
pneumatic	.....	.....	.....	.....
solid	6,906	.....	8,670	.....
vehicle	.....	$580	.....	$57
Other rubber manufactures.....	16,214	4,207	15,655	5,353
Totals, manufactured.....	$494,599	$4,787	$879,385	$5,410
Totals, rubber exports.....	$497,163	$4,787	$890,681	$17,292

United Kingdom Rubber Imports and Exports

Imports

FROM	June 1923	June 1922	June 1921	Six Months Ended June 1923	Six Months Ended June 1922	Six Months Ended June 1921
Straits Settlements and Federated Malay States..*tons*	2,676	3,244	2,712	20,877	20,202	29,841
Ceylon and British India...	866	839	902	6,749	6,574	10,873
Dutch East Indies, etc....	574	689	2,160	3,314	4,039	9,359
Brazil and Peru.....	265	103	104	1,716	1,711	1,108
Other Countries.....	119	5	11	819	210	485
Totals .....*tons*	4,520	4,880	5,889	33,475	32,736	51,666

Exports

TO	June 1923	June 1922	June 1921	Six Months Ended June 1923	Six Months Ended June 1922	Six Months Ended June 1921
United States .....*tons*	3,956	739	484	25,236	13,825	4,222
Canada	146	20	17	1,285	281	35
France	1,196	625	187	8,211	6,557	1,674
Belgium	69	108	182	869	706	481
Italy	325	115	49	2,049	1,213	436
Spain	8	21	5	104	248	61
Germany, Austria, Hungary	602	673	579	3,151	4,708	3,644
Russia	39	16	1	432	30	1
Sweden, Norway and Denmark	27	86	51	393	325	514
Other Countries in Europe.	29	178	264	410	684	803
Other Countries	18	77	6	184	163	40
Totals .....*tons*	6,415	2,658	1,825	42,324	28,740	11,911

Compiled by the Rubber Trade Association of London.

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Vol. 68 SEPTEMBER 1, 1923 No. 6

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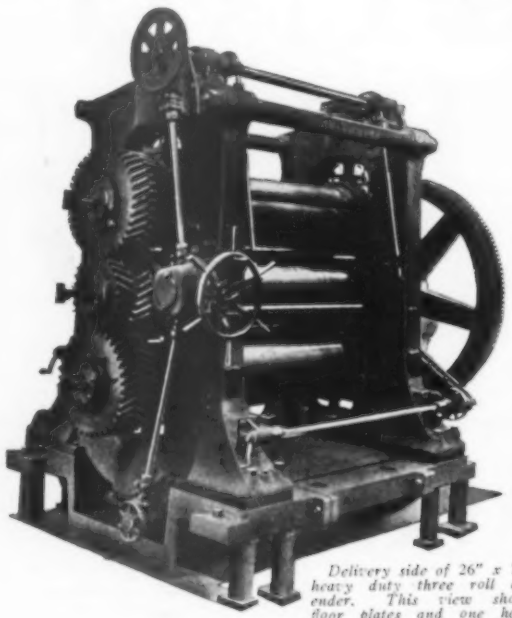

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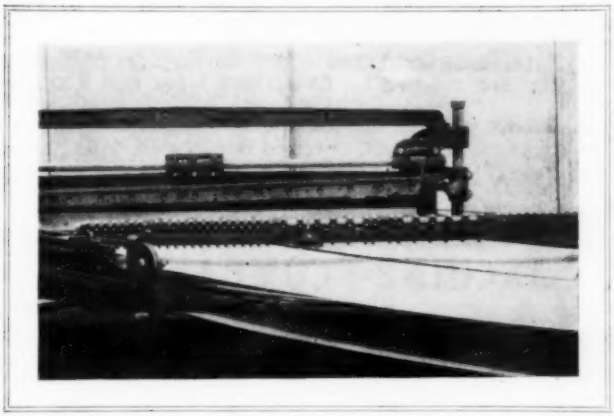

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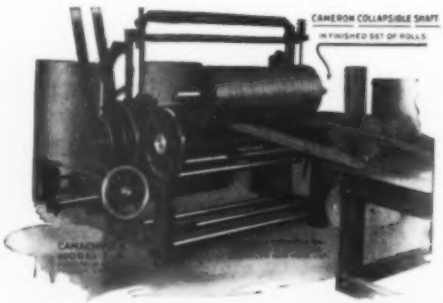

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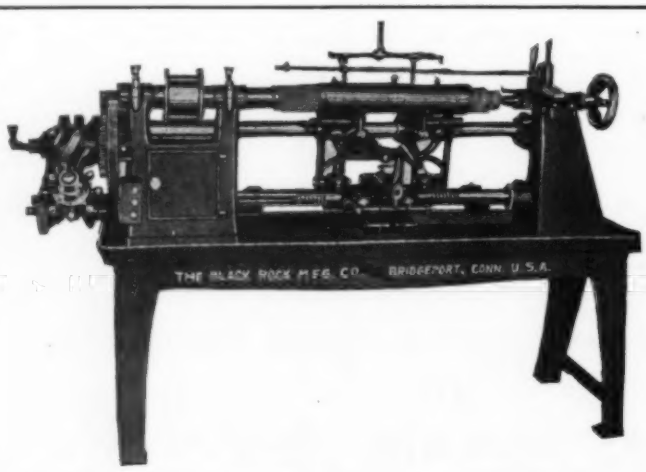

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Both Molded and Hand Made

NEW YORK, CHICAGO, BOSTON
SAN FRANCISCO

Cable Address:
DAVOL, PROVIDENCE
WESTERN UNION CODE

There's a Fisk Tire of extra value for every car, truck or speed wagon.

Fisk branches in 130 cities fill your order over night regardless of where you are located.

IT Doesn't Take a Prophet

nor the son of a prophet to forecast the growing demand for Giant Pneumatics. It is plainly visible. And the question for the tire manufacturer is this: Will he cash-in on it in a big way, or be content with merely scratching the surface?

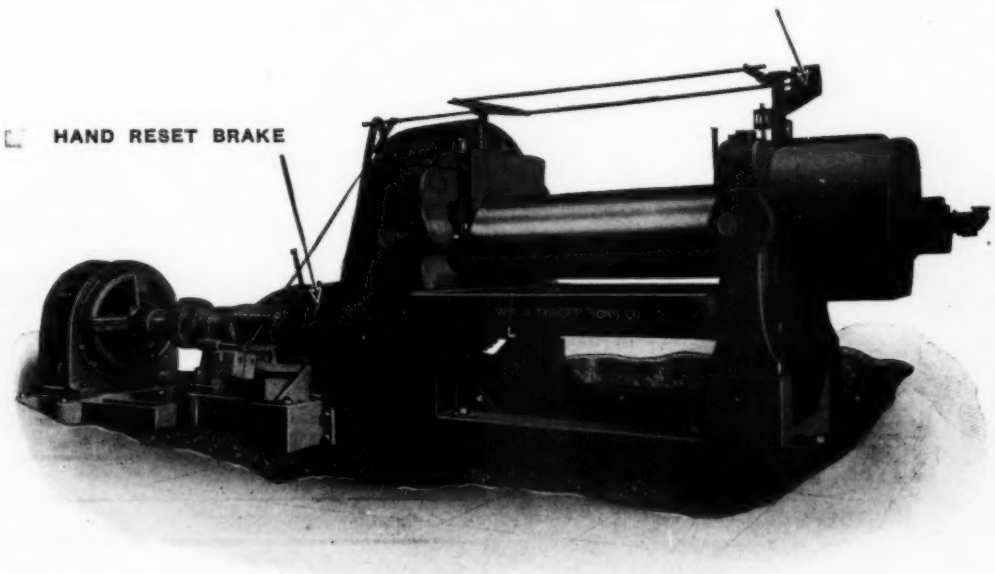
The Tires that win out must stand up in service —which means *ring-shaped tubes.* LOWE CIRCULAR TUBE-CURING MANDRELS are necessary equipment to capitalize the new demand. You need not invest beyond immediate requirements, and new units can be added to take care of increased output. Ask us for details.

At your service always

THE CLYDE E. LOWE COMPANY
CLEVELAND OHIO

THE NEW HAVEN SHERARDIZING COMPANY
Hartford, :-: *Distributors* :-: Conn.

MANUFACTURERS OF RUBBER MILL MACHINERY



20" and 22" x 60" INDIVIDUAL MOTOR DRIVEN GRINDER OR MIXER

Driven by a 100 horse-power Motor, 720 r. p. m., with a flexible coupling between the motor and drive. Gear drive is the herringbone type; pinion is forged steel and cut on shaft, reduction gear is of open hearth steel, cut. Top cap frames with steel gibs. All iron automatic adjustable guides; oil cups at the top of frames with pipes passing through same to lubricate the bearings. Equipped with all our "Safety First" equipment. Pan under the small connecting gears, and steel guard over same, with end shield and thimbles over stuffing boxes to contain oil and for protecting gears for safety. Master Gear enclosed in wire mesh guard.

One of the most important features of the machine is our safety stop for stopping the rolls in case of accident to the operator. The machine is equipped with overhead levers, and bars that can be operated in either direction—"up or down," from either side by some portion of the operator's body if both hands are caught between the rolls; this operates a small switch that is in series with low voltage release on motor, cutting the current off motor and at the same time operating a hand re-set brake that stops the momentum of the machine—(patent applied for). The bedplate of the machine contains the machine, drive and motor,—one unit, and on the same foundation line, making it easy to set up, and a more substantial and solid machine.

WILLIAM R. THROPP SONS' CO. Trenton, N.J., U.S.A.

Accurate Measuring of Temperatures—

Thermometers of questionable accuracy are a source of real danger.

Schaeffer & Budenberg Thermometers are *guaranteed* accurate. And over seventy years of thermometer-making experience is at your service, gratis, in the solving of your temperature measuring problems.

Crescent Thermometers

For every industrial need. Made in any range up to 1000° F.

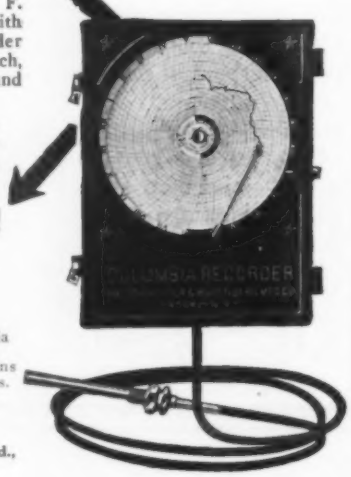
Reform Mercury Dial Thermometers

have the accuracy of the glass thermometer and the reading convenience of the dial face. Indicating dial may be mounted at any point convenient for reading. For temperature ranges up to 1000° F. With 4-in., 6-in. and 12-in. dial.

Columbia Recording Thermometers

with the Time Punch

For accurately recording all temperatures up to 1000° F. Mercury actuated. Fitted with that wonderful new recorder improvement, the Time Punch, which tells how often and when the chart is read.



Let us prescribe and quote on your Thermometer needs. You will find our Catalog N1 instructive. A copy is yours for the asking.

American Schaeffer & Budenberg Corporation

SUCCESSORS TO

Schaeffer & Budenberg Mfg. Co.
American Steam Gauge & Valve

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*Boston Cleveland Philadelphia
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*Stock carried at these branches.

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THAT HAS STOOD THE TEST FOR YEARS

Special GRADES for the following TRADES

INSULATED WIRE
BOOT AND SHOE
MECHANICAL—AUTO TIRE
PROOFING
HARD RUBBER

We will cheerfully furnish samples upon request

SOMERSET RUBBER RECLAIMING WORKS

NEW BRUNSWICK, N. J.

Factory—East Millstone, N. J., Somerset County

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Rubber Workers' Supplies

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Gums, Asphalts, Pitches, Waxes, Earths, Clays, Fillers, Dry Colors, Chloride of Sulphur, Rubber Substitutes, Lime Products for absorbing moisture, Bisulphide of Carbon, Mineral Rubber or Hydro Carbon, Cantella Gum, a rubber gum, etc.

LITHOPONE OXIDE OF ZINC
GOLDEN AND CRIMSON ANTIMONY

WILLIAM H. SCHEEL

159 Maiden Lane

NEW YORK, N. Y.

Reclaimed Rubber

For All Purposes

QUALITY

VALUE

SERVICE

RUBBER REGENERATING COMPANY

Largest Reclaimers in the World

(FOUR FACTORIES)

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United States Rubber Company

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Fifty-Three Factories
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Manufacturers of All Classes of Rubber Goods, including—

U. S. ROYAL CORD AND USCO TIRES
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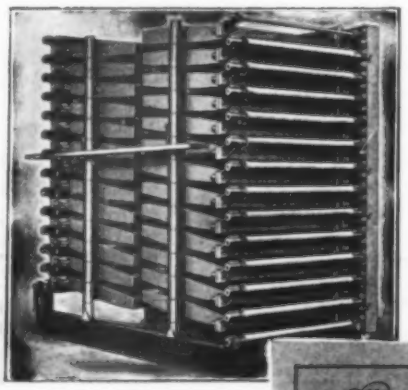
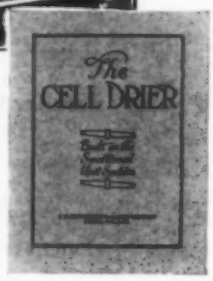
And Distributing Agencies in all other leading cities of the World.

Butterworth Cell Driers
utilize all the heated surface





This is but one feature of Butterworth Cell Driers. Another is the constant, even temperature you are able to maintain. Then there is the gravity circulating system—water **cannot** collect. Important also is the compactness of the Butterworth Cell Drier. Built cell upon cell it occupies a minimum of floor space. If you are interested we will be glad to send you a booklet on the Cell Drier.

FINISHING Butterworth MACHINERY

Butterworth Products

Ageing Machines	Mercerizing Ranges	Mangles (all kinds)
Bleaching Machines	Hydraulic Presses	Calenders (all kinds)
Drying Machines	Dyeing Machines	Color Kettles
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H.W. Butterworth & Sons Co.

Established 1820

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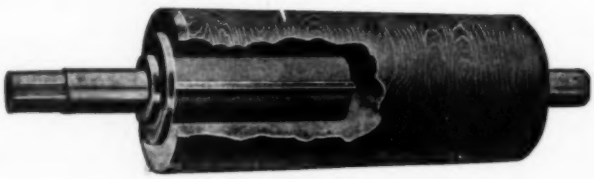
PERKINS HOLYOKE

PERKINS EMBOSSING ROLLS
For Rubberized Fabrics— Auto Tops, Etc.

Uniform in density and strength. Note the patented spline — it prevents either the heads or the roll from turning on the shaft.



B. F. PERKINS & SON, INC., Holyoke, Mass.
Sole Manufacturers

THE VULCANIZED RUBBER CO.

Manufacturers of

Hard Rubber Goods of every description

251 FOURTH AVENUE
New York

WORKS - MORRISVILLE, PA.

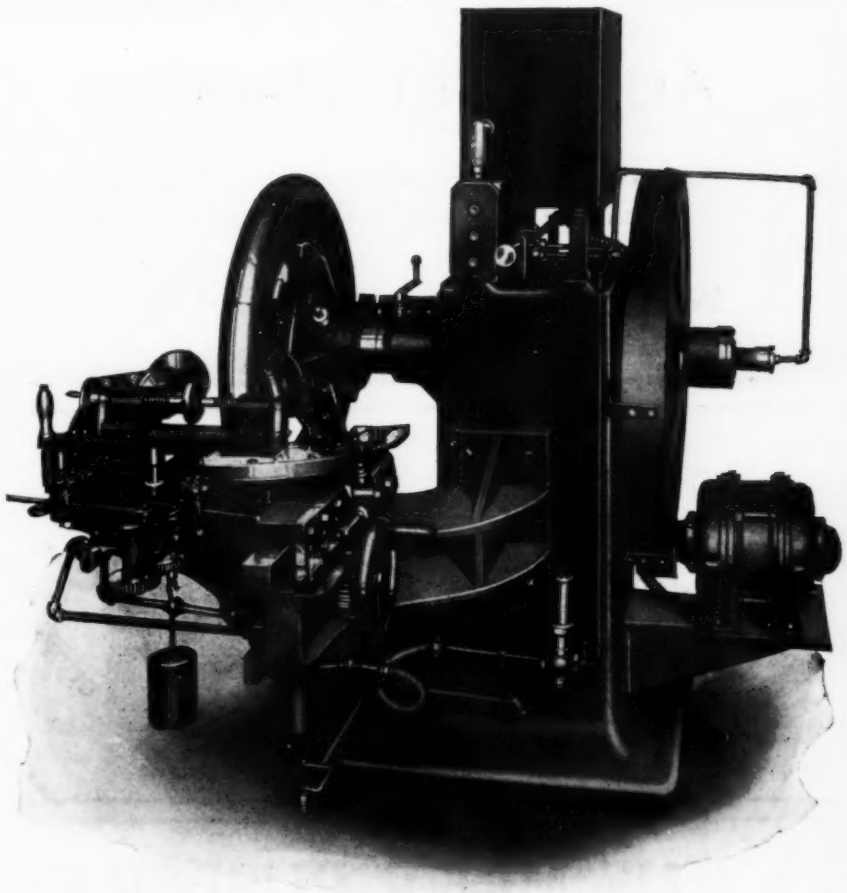
Thropp Improved Cord Tire-Making Machine

A few reasons why this machine should be in your factory

It eliminates hand work by mechanically stitching down the fabric on both sides of the core in one operation. Small floor space. Maximum production. Low cost per unit. Mechanically correct (proved by ten years' continuous use.) Over three hundred machines in daily operation.

A complete line of molds and tire making equipment

One of our customers advises they were able to produce a 30 x 3½ Clincher 5-ply cord tire finished all complete ready for the curing mold, every five minutes during a continuous eight-hour run, with one machine operator and one finisher.



Why not let us show you how to reduce your tire building costs?

JOHN E. THROPP'S SONS COMPANY

TRENTON, N. J., U. S. A.

APPLETON RUBBER COMPANY

Successor to

F. H. APPLETON & SON, Inc.

Office 185 SUMMER ST., BOSTON, MASS.

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MANUFACTURERS OF **RECLAIMED RUBBER**

ACUSHNET PROCESS COMPANY

Automobile tire friction reclaimed by the Acushnet process is the best quality product obtainable from your scrap. Acushnet quality reclaimed friction on sale.

NEW BEDFORD ∴ ∴ MASSACHUSETTS

HARD RUBBER

WE CAN SATISFY YOU ON THE DIFFICULT GOODS

—ALSO:—

GIVE US A TRIAL WE CAN PROVE IT

JOS. STOKES RUBBER CO.

TRENTON N. J.

Canadian Factory: Welland, Ontario.

THE MINER RUBBER CO., LIMITED

FACTORY GRANBY, QUE., CANADA

MANUFACTURERS OF ALL KINDS OF

RUBBER FOOTWEAR

BRANCHES ALL OVER CANADA

MINER RUBBERS

MINER'S INVINCIBLE

RUBBER RECLAIMERS

SINCE 1868

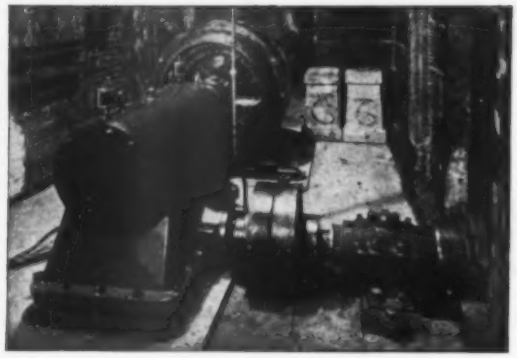
Still Supreme in Quality and Service

E. H. CLAPP RUBBER COMPANY

BOSTON, MASSACHUSETTS

Boston: H. P. FULLER Akron: J. A. KENDALL

1868



Cleveland Worm Gear Reduction Unit applied to rubber mill line shaft. Motor 200 hp. at 575 r.p.m. Reduction in worm drive 8 2/5 to 1.

TRUE ECONOMY IS MEASURED BY RESULTS

First cost is no longer recognized as a prime factor in operating economy.

Today men are thinking along lines of permanent economies. The larger the interests involved the more carefully is the constant expense considered. Overhead is a vital factor in earnings.

Thus it is interesting to note that our sales are largely made on the basis of proven performance to institutions who have learned by test and experience that Cleveland Worm Gear Speed Reduction Units effect permanent economies.

The more searching the test the more certain is the adoption of Cleveland Units.

For they appeal decisively on at least four counts:

(1) High efficiency — minimum power losses.

(2) Absolute evenness of torque insuring less wear and tear on machinery operated and frequently a much better product.

(3) Quietness of operation reflected in better service from and to employees.

(4) Low maintenance cost—no attention required except to maintain oil level.

There are many other advantages but these are outstanding gains that swing decisions.

Complete information is available on request together with facts concerning precise uses.

The Cleveland Worm & Gear Co.

America's Worm Gear Specialists

CLEVELAND, OHIO

Cleveland WORM GEAR REDUCTION UNITS

SHAWS

specialize in supplying the complete MECHANICAL, HYDRAULIC, STEAM and ELECTRICAL EQUIPMENT for both RUBBER PLANTATION and MANUFACTURING FACTORIES

ENQUIRIES SOLICITED

Francis Shaw & Company Limited.

PHONE (Central 1749/50. GRAMS (Calender. Manchester.

BRADFORD. LONDON OFFICE AUSTRALIA HOUSE STRAND, W.C.2 MANCHESTER.

NATIONAL PRODUCTS

BARYTES

Barytes is the most finely divided filler in its class known to the rubber industry. Coarse materials invariably show up in the finished product. Barytes is an impalpable dust, free from moisture, acid and foreign substances. Goods filled with Barytes will never show the filler.

Barytes produced by the National Pigments and Chemical Co. is 300 mesh. This means that it will pass through a screen containing *89,401 microscopic holes to the square inch!*

Use Barytes. You will get better results, and it is easier to mix.

NATIONAL PIGMENTS & CHEMICAL CO.
ST. LOUIS, MO.

NATIONAL BARYTES RUBBER FILLER

G-70

CABARRUS COTTON MILLS

M. L. CANNON
PRESIDENT & TREASURER
KANNAPOLIS, N. C.

Superior Quality Tire Fabrics

EGYPTIAN-PEELER KARDED & COMBED
CORD & SQUARE WOVEN

CANNON MILLS, Inc.

Selling Agents

NEW YORK
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A. W. REID
Representative

Our upwards of thirty-five years of practical. constructive manufacturing experience are at your service.

IF

N. B. O.

the

Original Black Sheet

were our only achievement of note during the time we might feel satisfied, but all our lines of Sheet and Rod Packings, Hose, Belting, Matting, Tubing, Pump Valves, etc., are as firmly established in reputation as the best and most dependable.

We have long since earned the reputation as being EXPERTS in the mechanical line.

HOME RUBBER CO.

Factories: Trenton, N. J.

NEW YORK CHICAGO PITTSBURGH LONDON

NON-STICKING LINERS

STRENGTH ∴ DURABILITY ∴ ECONOMY

Processed Under License
THE B. F. GOODRICH CO.
Patents Pending

THIS improved process not only renders liners cleanly non-adhesive but also increases tensile strength and durability, thus resulting in all around economies.

Compound used in this process is not detrimental to stocks and has no affinity for rubber, oil, gasoline, sulphur, etc.

ECONOMIES IN MANUFACTURE

Labor and Power Reduced
Separation Facilitated
Brushing and Cleaning Saved
Horizontal Storage Allowed

BENEFITS TO STOCK

Air, Moisture and Sunlight Excluded
Oxidation, Mould and Bloom Prevented
Freshness and Tackiness Preserved
Gauge Stocks Maintained
Latitude in Compounds Permitted

New fabrics of any weight and width can be treated.

Quotations for processing fabrics furnished by the customer will be made on receipt of specifications.

The Cleveland Mixer & Manufacturing Co.

Exclusive Licensee

5508 Maurice Avenue, Cleveland, Ohio

LIQUID RUBBER

A super-flux that provides "tack" and prevents bloom, eliminating any difficulty in milling operations.

DIPHENYL-DIAMINO-CARBAZOL

A fool-proof and non-poisonous organic accelerator. Will not scorch nor overcure. Especially adapted to hard rubber, mechanical goods, insulated wire and most tire stocks. Furnished in a fine uniform powder at a substantial saving in cost.

RUBBER LEAD

Replaces Litharge in rubber mixes. Specific gravity 3.61. Costs less and cures stronger.

Send for sample and particulars.

THE SYNTHETIC PRODUCTS CO.

MERWIN AND CENTER STS. CLEVELAND, O.

We Specialize in

GARDEN AND STEAM HOSE MANDRELS

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CAR COUPLING HOSE MANDRELS

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FRUIT JAR RING MANDRELS

SUPPLIED IN circular and straight. All highly polished, sherardized and buffed.

We supply and insert plugs at a nominal charge.

We specialize in grinding and treating old steel poles. See us before discarding.

We are distributors of the

Clyde E. Lowe Seamless Cold Bent Circular Mandrels

THE NEW HAVEN SHERARDIZING CO.

868 WINDSOR STREET, HARTFORD, CONN. ∴ BRANCH PLANT—AKRON, OHIO

Representatives in Cleveland, Ohio; Canada, and London, England

SOUTHWARK
HYDRAULIC EQUIPMENT
for RUBBER MANUFACTURING PLANTS

AMONG OUR PRODUCTS

Battery Jar Presses
Bead Presses
Belt Presses
Belt Stretchers
Forged Steel Molds
Hard Rubber Forming Presses
Hose Presses
Lead Cable Covering Presses
Pneumatic Tire Heater Presses
Quick Opening Doors
Rimming Presses
Rolled Steel Steam Platens
Solid Tire Heater Presses
Sole and Heel Presses
Steam Platen Presses
Sundry Drug Presses
Tire Forcing Presses
Vulcanizers and Doors
Hydraulic Pumps
Accumulators, Valves, Pipes and Fittings

We have just received from the press a booklet which will be of the greatest interest to all users of hydraulic machinery. It contains a large number of installation pictures similar to the cut shown on this page. This is your opportunity to see how other manufacturers are accomplishing their work.

Your copy is ready for mailing, send for it.

SOUTHWARK STEAM PLATEN PRESSES AT THE NEW YORK RUBBER CO. BEACON, N. Y.

DESIGNERS AND BUILDERS OF RUBBER VULCANIZING AND MOLDING MACHINERY. SPECIAL MACHINERY DESIGNED TO SUIT THE MANUFACTURER'S REQUIREMENTS

Established 1836

CLEVELAND
SWETLAND BLDG.

SOUTHWARK FOUNDRY AND MACHINE CO.
ESTABLISHED 1836
PHILADELPHIA, PA.

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CHALK—WHITING

K-T

K-T CHALK WHITING is a GENUINE PURE CHALK, very LIGHT and FLUFFY. It is extremely fine mesh and runs absolutely uniform. A BULKY, SOFT and AMORPHOUS whiting that is free from flint or any other gritty substance. Does not have a "cutting edge."

A pigment of high standard, particularly adapted for rubber compounding.

K-T CHALK WHITING is produced in the United States and each shipment is exactly alike. Uniformity—Quality—Reliability.

WRITE FOR SAMPLES

We are manufacturing and can produce K-T Chalk Whiting to meet your special requirements.

YOU ARE ASSURED OF IMMEDIATE SHIPMENT, RELIABLE IN QUALITY AND ECONOMICAL IN COST.

Krippendorf-Tuttle White Cliffs Products Co.

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STOCKS CARRIED IN WAREHOUSE AT BOSTON, NEW YORK, CHICAGO

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GOLDEN CRIMSON VERMILION

ANTIMONY SULPHURET

15%–17% FREE SULPHUR

THE HARSHAW FULLER AND GOODWIN CO.

Cleveland, Ohio

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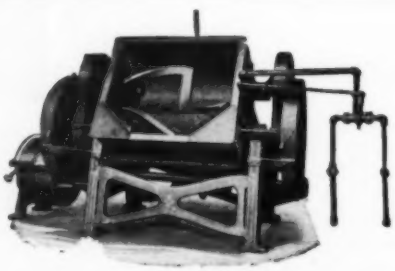

Made in four sizes, either plain or steam-jacketed for mixing materials requiring heat when being agitated.

A DAY Mixer Built for Heavy Duty

The DAY Imperial Mixer shown above has met with the favor of most large rubber manufacturers, in whose plants these mixers have been used for years. Its heavy construction and carefully designed agitators make this machine especially adapted to the mixing of tough rubber compounds. Let us send you prints and a list of users of this equipment.

Write for our new Catalogue of Special Mixing and Grinding Machinery

THE J. H. DAY COMPANY

Cincinnati, Ohio

Day Service Representatives in 15 Principal Cities

New York Boston Philadelphia Kansas City Buffalo Milwaukee Minneapolis St. Louis Pittsburgh Columbus San Francisco Dallas Atlanta

The Colossus of Roads

OUR world today moves forward on rubber cushions. Shoes with soles and heels of rubber cover our sidewalks, while millions of rubber tires ceaselessly revolve upon our roads.

Science has met the tremendously increased demands on rubber by perfecting a rubber compound thrice as strong and with many times the wearing qualities of the compounds of yesterday, by the introduction of

MICRONEX
Reg. U.S. Pat. Off.

Carbon Black

which possesses qualities that hold the rubber in a vise-like grip, a compound with a toughness, tensile strength and degree of resilience undreamed of a few short years ago has been achieved. The Black Tread Tire, compounded with MICRONEX (as most standard make tires now are) is indeed the new colossus of roads.

Recognition of the value of MICRONEX has been vividly brought home to us by a demand which for a time far exceeded our utmost output. Now, however, due to rapidly enlarged manufacturing facilities, we are glad to state that we can meet our customers' requirements with a full supply.

BINNEY & SMITH CO.

41 East 42nd St. **New York City**

Agents with stocks located in Cleveland, Akron, Chicago, San Francisco, Los Angeles, Toronto and Montreal.

TYPKE & KING, Ltd.

Look for the seal

T&K

None genuine without it

Crown Chemical Works
Mitcham Common, England
SINCE 1883

GOLDEN and CRIMSON
ANTIMONIES

Look for the seal

CROWN CHEMICAL WORKS · TYPKE & KING LTD · MITCHAM COMMON

None genuine without it

Standards unexcelled for uniformity, also

Pure Pentasulphide of Antimony

Contains 16% Free Sulphur, absolutely nothing finer produced

RUBBER SUBSTITUTES

WHITE BROWN BLACK

For discriminating buyers.

Stocks Carried by our Agents

239 FRONT STREET **L. H. BUTCHER COMPANY, Inc.** NEW YORK CITY

Sole Canadian Agents: MESSRS. E. A. SCHOFIELD & CO., St. Nicholas Building, Montreal.
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Genasco

MINERAL RUBBER

A hard, natural hydrocarbon.

Produced under the strict supervision of an experienced and up-to-date laboratory.

Of uniform quality.

Aging tests unequalled.

Will not oxidize as do cheaper grades of mineral rubber.

Shipped to all parts of the world in metal drums.

Stocks carried at Maurer, N. J., Madison, Ill., and by Union Chemical Company, Boston, Mass.

THE BARBER ASPHALT COMPANY

New York PHILADELPHIA Chicago
Pittsburgh St. Louis Kansas City

Producer of Gilsonite, Trinidad and Bermudez Lake Asphalts, and Asphaltic Products

Cable address, BASPACO—Philadelphia

The Mark of Quality

A massive, powerful tire that protects the heaviest trucks and loads, securely grips the smoothest as well as the roughest roads in any weather, and wears slowly and evenly for thousands of extra miles. The truck owner's favorite for difficult hauling jobs.

Most Miles per Dollar

FIRESTONE TIRE & RUBBER CO., Akron, Ohio

Firestone

HEAVY DUTY CUSHION

No Air Wanted—

Do you manufacture a rubber product in which unusual resistance to "aging" is an essential quality—a product which must retain its tensile strength and resilience over long periods of time?

Then your product is one in which *no air is wanted;* for air is the natural enemy of the "life" of rubber. Air makes its way into the minute pores of the rubber product, oxidation starts and the material soon loses its "spring" or "comeback".

But make Robertson Mineral Rubber (RMR) an ingredient in your rubber compound and you will overcome to a great extent the deteriorating action of the air.

Robertson Mineral Rubber combines so readily and completely with crude rubber and all compounding ingredients that it produces a mixture of remarkable density. It fills the spaces otherwise occupied by air. As a result the deteriorating effect of oxidation is minimized and the life of the rubber is prolonged. The product retains its resiliency and tensile strength long after it has left the factory.

Because of these and other valuable benefits which it brings to every rubber product it enters, RMR is used as standard by over 250 rubber manufacturers. Write for full particulars.

H. H. ROBERTSON COMPANY, Pittsburgh, Pa.

Advantages of R M R

(1) RMR analyzes 90.5% pure.
(2) produces a better finished mix.
(3) makes the rubber mix easier to work.
(4) prevents drying before vulcanization.
(5) prevents blooming and blowouts.
(6) shortens the curing process
(7) lowers production costs.

Factories and Branches

Factories: Ambridge, Pa., and Sarnia, Ont. *Branch Offices:* In all principal cities in the United States. Also London, E. C., England, Edw. LeBas & Co., Dock House, Billiter St.

For Canada: H. H. Robertson Co., Limited, Sarnia. Sales Agents, Garnet Lea, 289-291 Sumach St., Toronto, Ontario.

ROBERTSON PROCESS

THE
GENERAL
CORD TIRE

—goes a long way to make friends

BUILT IN AKRON, OHIO BY THE GENERAL TIRE & RUBBER CO.

Crimson Antimony **Golden Antimony** **Aniline Oil**

TRIPHENYLGUANIDINE **ANILINE SULPHATE**
ETHYLIDENE ANILINE **CRYLENE**

These last two accelerators protected by our Patent No. 1417970

Manufactured by

THE NAUGATUCK CHEMICAL CO.
Established 1904 NAUGATUCK, CONNECTICUT

Hewitt Rubber Company

Manufacturers of High Grade
Mechanical Rubber Goods

Specialists in
Cord Tires **Inner Tubes**
Fabric Tires

General Offices and Works
BUFFALO
240 Kensington Avenue

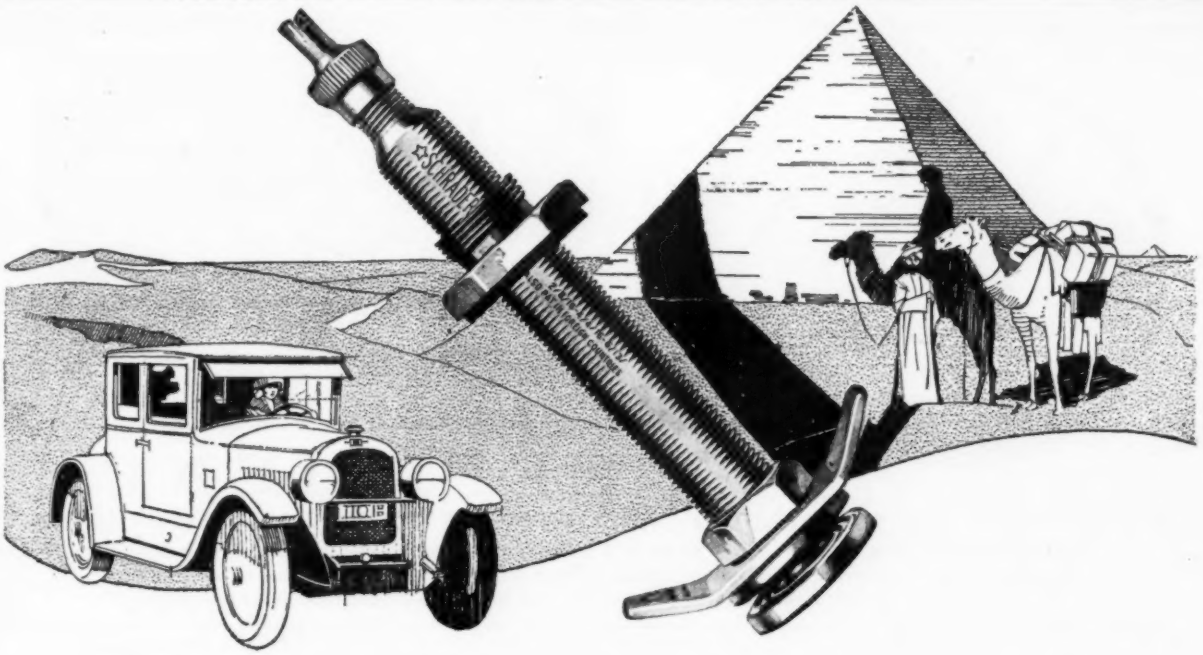
NEW YORK
111 Broadway

CHICAGO
431 Railway Exchange Bldg.

The Best Engineers Specify "WESTERN"

WHEN THEY WANT THE BEST PUMP VALVES — BECAUSE EVERY VALVE HAS OUR GUARANTEE BACK OF IT. LET US CONSULT WITH YOU WHAT IS BEST FOR YOUR SERVICE.

WESTERN RUBBER COMPANY
GOSHEN, IND.



The shadow of the tire valve reaches to the Pyramids

THE automobile on its pneumatic tires moves toward the Pyramids past camels whose padded feet swish through the desert sand. The product of modern genius stops beside the monument to an ancient civilization.

The motor car searches the highways of the world—but only since the manufacture of pneumatic tires that hold air. In fact, the real development of the entire automotive industry dates from the successful use of pneumatic tires—*with their tire valves.*

The tire needs its valve

From the first, the pneumatic tire had to depend upon its tire valve. No matter how well a tire is made, its length of life rests largely upon the ability of its valve to retain the air in it.

For more than thirty years Schrader Universal Tire Valves have been successfully holding in air. They were on the first pneumatic tires made in the United States. Their development and improvement since then have kept pace with the growth of the automobile industry and the increasing demands made on every part of the automobile.

Schrader valves help tire life

Designed by expert engineers and made by skilled craftsmen Schrader Valves conform to the most up-to-date principles of valve construction. Every Schrader Valve undergoes exacting tests before it leaves the factory. Thus, tire manufacturers can be sure of getting valves that will help their tires live their full life.

Equip all your pneumatic tires with Schrader Valves and Valve Parts. Manufacturers and supply houses can always get prompt shipment of tire valves and parts from our large stocks.

A. SCHRADER'S SON, Inc., Brooklyn, N. Y.

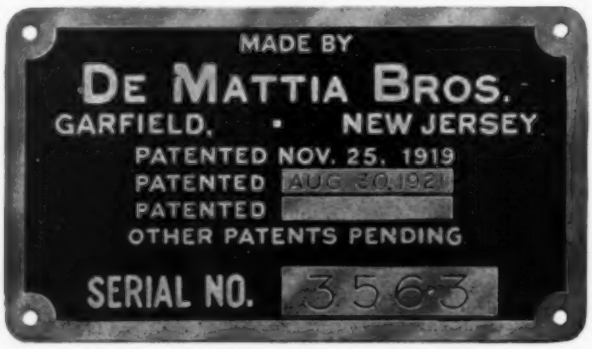
Chicago Toronto London

Manufacturers of Schrader Valve Insides, Valve Caps, and Tire Pressure Gauges

SCHRADER

TIRE VALVES

The "Automatic"—No Royalties



A GUARANTEE OF

EFFICIENCY

RECOGNIZED BY THE GREAT MAJORITY OF TIRE MANUFACTURERS

For pneumatic tires from 27 x 3½ to 40 x 8 and including super-cushion tires. The same experience and high grade workmanship, which have made De Mattia Patented Core-Chucks the accepted Standard of the Trade, are back of our *tire building, core and mold equipment.*

Let Us Submit Tire Designs and Estimates on Your Mold Equipment

Specializing in Tire Building Equipment

DE MATTIA BROS. Established 1909 Garfield, N. J.

Licensed Manufacturers of Cores
Akron R. M. & M. Co., Akron, Ohio
Banner Machine Co., Columbiana, Ohio
Williams F. & M. Co., Akron, Ohio

Sole Licensees for Foreign Countries
For the Dominion of Canada
Bawden Machine Co., Ltd., Toronto, Canada

For England and the Continent of Europe
David Bridge & Co., Ltd.
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THE MANHATTAN RUBBER MFG. CO.

SOLE MAKERS Condor BELT

Factories, Warehouses and Executive Offices:
PASSAIC, NEW JERSEY

SOLE MAKERS Condor BELT

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MECHANICAL RUBBER GOODS

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COLUMBUS, Gugle Building.
DETROIT, Penobscot Building.
MINNEAPOLIS, 424 Washington Ave., No.
NEW ORLEANS, 500 Camp Street.
NEW YORK, Equitable Bldg., 120 Broadway.
PHILADELPHIA, 1318 Arch Street.
PITTSBURGH, Union Arcade Bldg.
PORTLAND, ORE., 68-70 First Street.
SALT LAKE CITY, Walker Bank Bldg.
ST. LOUIS, 411 Olive Street.
SAN FRANCISCO, 315 Market Street.
SPOKANE, S. 157 Monroe Street.
TULSA, 217 E. Third Street.

CABLE ADDRESS—MIALOGIA, N. Y.

Further Accelerator Progress

A-19

A Modification of ETHYLIDENE ANILINE

Powder Form

ADVANTAGES

IN THE FACTORY

MIXING

No milling troubles whatever, because—

(a) No Master Batching required

(b) A-19 melts on the mill—therefore it becomes thoroughly dispersed.

CALENDERING

A-19 has none of the calender troubles so frequently met with. Progressive Rubber Companies throughout the country are using large quantities of A-19 without the least bit of scorching trouble. Difficult calendering conditions are easily overcome by using A-19.

CURING

(a) A-19 is quite powerful. The acceleration cost per 100 lbs. of rubber is very low.

(b) Because of the long flat curing curve of A-19 a margin of safety in heater and press operation is provided which assures fewer seconds and less off cure product.

(c) Complete absence of fumes.

IN THE PRODUCT

(a) Because of the long flat curing curve one can obtain an absolutely uniform cure throughout even the thickest tires, both solids and pneumatics.

(b) Tensile strength and energy of resilience values are quite high.

(c) A-19 gives wonderful unions.

(d) Stocks have the same remarkable resistance to tearing that was found with A-7 (the soft modification of Ethylidene-Aniline.)

(e) Resistance to flexing properties are excellent.

(f) Both natural and artificial age tests show that when properly compounded and cured A-19 stocks have better ageing characteristics under like conditions than any other accelerator.

(g) Actual road tests have demonstrated the value of A-19 for tire work.

(h) Because of its many advantages a quality tire may be produced with A-19 at competitive prices.

THE RUBBER SERVICE LABORATORIES CO.

611 Peoples Savings and Trust Building **AKRON, OHIO**

THE FRUIT OF FIVE YEARS RESEARCH

"IT IS AS FINE AS GAS BLACK"

Pure Antimony Pentasulfide

Both Crimson and Golden

STOCK IN AKRON, O.
TYLER-PATTERSON CO.
CLEVELAND, O., AGENTS

RARE METAL PRODUCTS CO.
BELLEVILLE - - NEW JERSEY
MANUFACTURERS

BROCKTON TOOL COMPANY

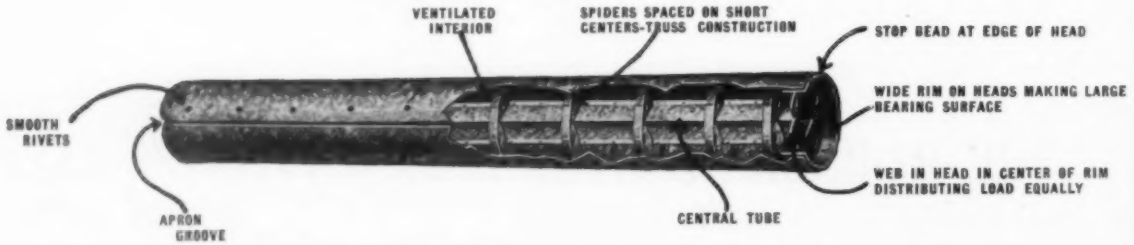
103 BELMONT STREET

QUALITY HEEL MOULDS

BROCKTON, MASS.

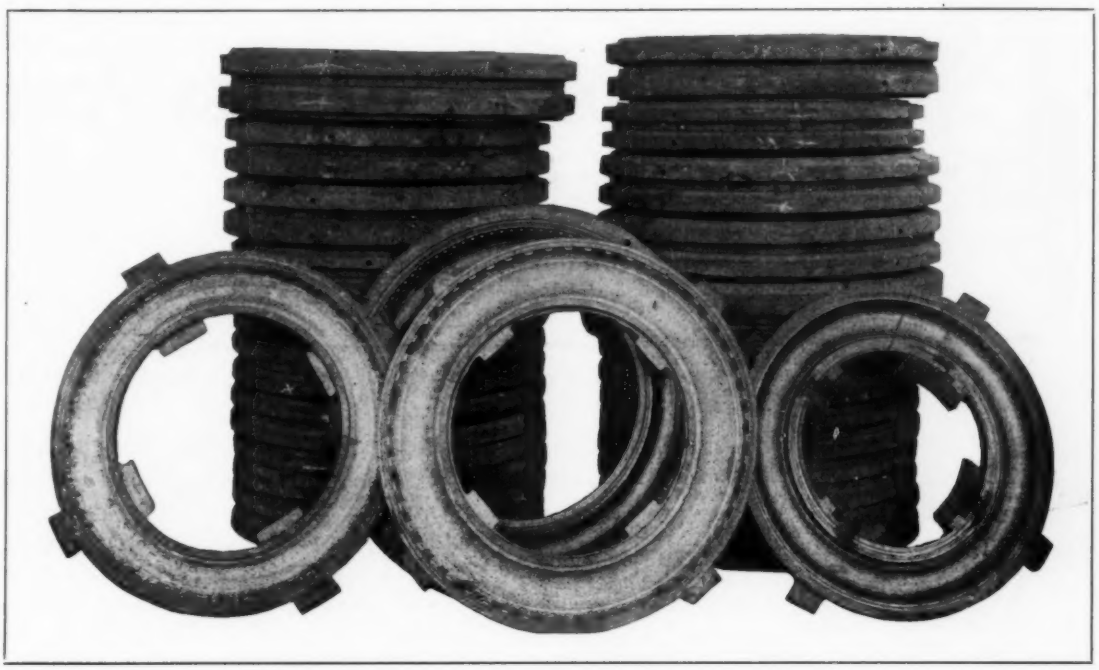
Most Rubber Manufacturers Use Universal Steel Calender Shells

The Illustration Shows Why


VENTILATED INTERIOR
SPIDERS SPACED ON SHORT CENTERS-TRUSS CONSTRUCTION
STOP BEAD AT EDGE OF HEAD
WIDE RIM ON HEADS MAKING LARGE BEARING SURFACE
WEB IN HEAD IN CENTER OF RIM DISTRIBUTING LOAD EQUALLY
SMOOTH RIVETS
APRON GROOVE
CENTRAL TUBE

THE W. F. GAMMETER COMPANY

CADIZ, OHIO



A CONCERN IS KNOWN BY ITS CUSTOMERS

JUST as a man is known by the company he keeps, so a business concern is known by its customers. Since our company was organized in 1917 most of our extensive mold and core production has been for the largest and most successful tire manufacturers in the world, such as Goodyear, Goodrich, United States, Kelly-Springfield, Fisk and Lee.

That our shop has become an auxiliary to the design and production departments of leading tire makers is a guarantee of our work and service. Such firms realize the importance of uniformly good and accurate tire-building equipment. Their specifications are exacting, their inspections rigid They know that they can depend on us for fair prices, high quality, prompt service and respected confidence.

Our ability to maintain the highest standards of our highly specialized trade is due to our superior equipment of men and machinery. The experience of our management dates back to the pioneer days of the industry. Our modern and complete plant and machinery provide exceptional conditions and facilities, and our mechanics are second to none in skill and painstaking.

Estimates promptly furnished. Confidences strictly respected.

THE AKRON EQUIPMENT COMPANY

MACHINISTS OF SKILL AND EXPERIENCE

EAST EXCHANGE STREET, at Annadale Avenue, AKRON, OHIO

For Composition Molding

Burroughs Rodless Press

A multiple opening press.

Simple, compact, rigid construction. No rods to stretch or nuts to work loose.

Furnished with or without platens for heating or chilling, in any size or power.

Ribs cast on top and bottom platen to prevent conduction of heat to press and ram.

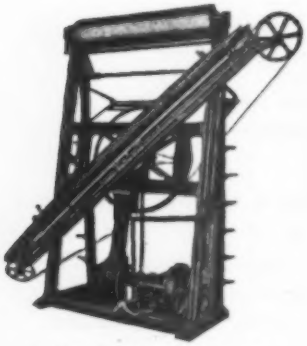
We are specialists in machinery for molding Bakelite, Condensite, Redmanol, Pyroxylin Compounds, Shellac Compositions, etc.

THE BURROUGHS COMPANY

246 North Tenth Street *Established 1869* Newark, N. J., U. S. A.

Builders of Hydraulic Machinery for All Purposes

Made By Spadone For a Field of Its Own

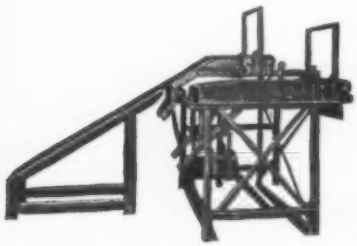


Bolton Vertical Bias Cutter

Bolton Vertical Bias Cutter
Single Lining Stripper
Double Lining Stripper
Wind Up Machine

The most economical, accurate and efficient equipment for the cutting of fabrics on the bias.

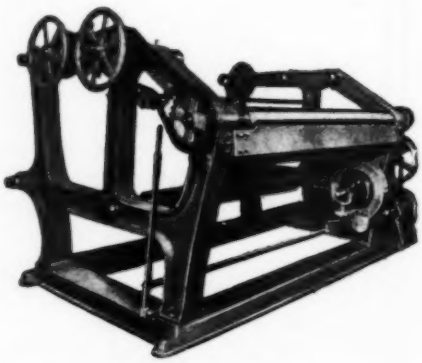
THE WIND-UP MACHINE IS OUR LATEST DEVELOPMENT, TAKING CARE OF THE STOCK AFTER IT HAS BEEN CUT ON THE BOLTON VERTICAL BIAS CUTTER — HOWEVER IS SUITABLE FOR ANY TYPE OF BIAS CUTTING MACHINE.



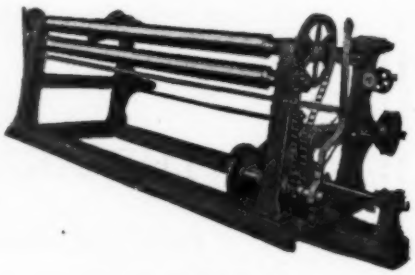
Wind Up Machine

"If Unbiased—
You'll Buy It"

SPADONE MACHINE CO., Inc.
15 Park Row, New York City



Double Lining Stripper



Single Lining Stripper

Sulzin

The New Inorganic Accelerator

Some of the Advantages of Sulzin

Being *inorganic* it can be treated and handled in the same manner as any inorganic filler, and mixes on the rollers or in an enclosed mixer in the same way as any other ingredient.

It remains inert until subjected to a temperature of 240 deg. Fahr. In consequence it does not scorch or vulcanize on the rollers or in a tubing machine. *It does not prevent the remilling of uncured stock even if left for weeks.*

Any speed of vulcanization required can be obtained.

Its ability to improve the quality of the finished product compares favorably with the best organic accelerators.

It is non-poisonous.

It imparts no smell to finished goods and is therefore suitable for rubber tiling, and other products where freedom from smell is essential.

It does not discolor or affect the tinctorial properties of antimony sulphide, lithopone, red oxide, and other pigments.

It has no more rapid after cure than when no accelerators are present.

It minimizes the risk of sulphuring up and has no unsatisfactory ageing effects on finished goods.

It is quite safe to use in rubber solution.

It is sent out in the form of a white powder in a very fine state of division ready for use.

Sulzin can be used in both hard and soft rubbers and is suitable for any mix where an accelerator is added.

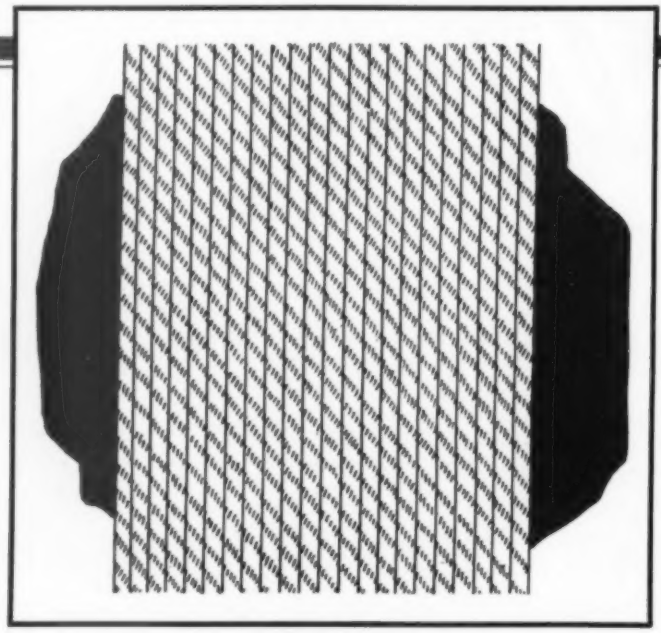
Send for free sample and test it for yourself.

Sulzin *Stands for Safety and Reliability in Rubber Manufacture*

Sales Agent for U. S. A.

JOSEPH A. McNULTY

114 LIBERTY STREET, NEW YORK CITY



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The New Weftless or Web Cord Construction

"ULTRATEX"

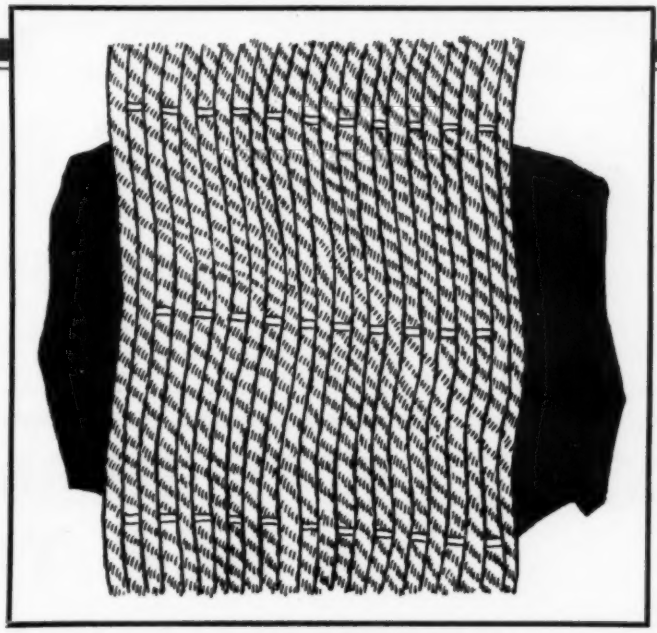
(PATENTED)

No Change in Present Equipment
Impregnate or Direct Calender
No Machinery Investment
No Royalties. No Cotton Surcharge

WEB CORD PRINCIPLE ENDORSED
BY LEADERS OF THE INDUSTRY

STIGATE

Developed and Protected for the Entire Rubber Industry



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PRODUCES:

MORE RESILIENT TIRES
MORE TIRES PER POUND OF COTTON
MORE HOMOGENEOUS CARCASS

For Cotton Information

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ULTRATEX PRODUCTS CO.
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VICTORIA VENETIAN RED

RED OXIDES OF IRON

Strictly Pure and Impalpably Fine

A scientist says: "A tire made of The Westmoreland Chemical & Color Company's 'Rubber Makers No. 600' will generate less heat and wear longer (because the oxide is inert) than any other of the colored compounding substances."

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CONTINENTAL RUBBER COMPANY of NEW YORK

CRUDE GUAYULE RUBBER

"DURO" Brand Washed and Dried Ready for Compounding

120 BROADWAY — NEW YORK

Cord Tire Fabrics

We have 24 regular styles and as manufacturers are equipped to supply you with fabrics and cords made to your specifications.

LIGHT WEIGHT CORDS

We also specialize in light weight cords and will be glad to quote on all types of fabrics used in tire building.

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Marlboro Cotton Mills

McCOLL, S. C.

Model 1-E

An economical, fast, high-grade, semi-automatic

SINGLE TIRE WRAPPING

machine. Wraps uniformly. Folds perfectly the edge of any paper including creped paper.

This machine patented and is sold outright.

We also build machines for wrapping truck tires, small and large wire coils, strip steel coils, flexible conduit. Machines for baling or bundling tires and hose. Write for illustrated folder.

TERKELSEN MACHINE COMPANY

Largest and most complete line of wrapping machines in the world

TERKELSEN BUILDING — BOSTON, U. S. A.

The Philadelphia Rubber Works Company

Manufacturer of

Reclaimed Rubber

of

Standardized Quality

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Leech-Neal & Co's FINE RED OXIDES~

Sold in the U.S.A. thru Joseph A. McNulty
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It Costs No More to Buy the Best !

"THE SIGN OF SERVICE"

UNVULCANIZED RUBBER OF SUPERIOR QUALITY IN MATS, SHEETS OR ROLLS

Lately our mill capacity for Dental Rubbers of highest grade has been largely increased and we are in a position to render exceptional service in supplying Mixed or Calendered Stocks where color considerations and quality are of paramount importance.

Consultation on your Rubber problems invited.

THE S. S. WHITE DENTAL MFG. CO.
211 South 12th Street, Philadelphia, Pa.

"AUWICO"
GRITLESS RUBBER COLORS

ARE
- Especially made for the Rubber Trade.
- Amorphous, and GRITLESS.
- Sulphur free.
- Inert, and contain no ingredients detrimental to rubber compounding.
- Tinctorially strong and of pure tone.
- Of light specific gravity.

WILL
- Withstand all cures.
- Not bleed.
- Work well with standard Accelerators.
- Not affect tensile strength.
- Give full shades with 1% to 2%.

SEND for colored vulcanized rubber samples, and the GRITLESS COLORS themselves.
OUR Rubber Laboratory is at your disposal.
LET us help you solve your COLOR PROBLEM.

GRITLESS RUBBER COLORS
ONLY MADE BY
THE AULT & WIBORG CO.
CINCINNATI, OHIO, U. S. A.

Announcing
TIDECO ANTIMONY

CRIMSON GOLDEN

TIDECO ANTIMONY is the latest addition to our line of chemicals, colors and fillers for rubber compounding.
A standardized product made in the various percentages from sulphur free to 57% sulphur. Rubber manufacturers realize how important it is to know the exact amount of free sulphur in antimony. Tideco Antimony fills this need. Each shipment is absolutely uniform, assuring consistent action and eliminating readjustment of formulae.
Constant in color and quality. Economical, because of its greater coloring power you may use 20 to 33% less.
Write Dept. C and let us furnish further information demonstrating these claims we make for Tideco Antimony.

TIDEWATER CHEMICAL CO.
INCORPORATED
440 Washington St. New York, N. Y.

MEADE RUBBER CO.
STOUGHTON MASS.

MANUFACTURERS OF
HOSPITAL SHEETINGS
GEM DUCK
RUBBER HEELS

Shoe Factory Specialties

PERFECT BEADS

Entire freedom from bead trouble in the construction of straightside tires is assured by the use of either National (Patented) High Tensile Strength, Flat Woven, Bead Braid or our new (Pratt Patent) Bead Cables. These cables, made to dimensions specified, have seven strands, yet only one piece of wire is used without soldered, welded or brazed joint.

Our engineering department tests beads and furnishes complete confidential reports as to their stretch, set and bursting point, without charge. Inquiries solicited regarding this special service.

Write for working samples of either National flat braid or Pratt Cables (no charge to tire manufacturers) and full information as to our products and service.

National-Standard Company
NILES, MICHIGAN, U. S. A.

PEQUANOC STANDARDS

RECLAIMED RUBBER

RECOGNIZED FOR

UNIFORMITY

RELIABILITY

CLEANLINESS

COUPLED WITH

"PEQUANOC SERVICE"

PEQUANOC RUBBER CO.

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BUTLER, NEW JERSEY

CALL on us when you must have rush delivery of any grade of crude or scrap. Our nearest branch can take care of your needs in the shortest time possible.

H. MUEHLSTEIN & CO., Inc.

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AKRON
416 Metropolitan Bldg.

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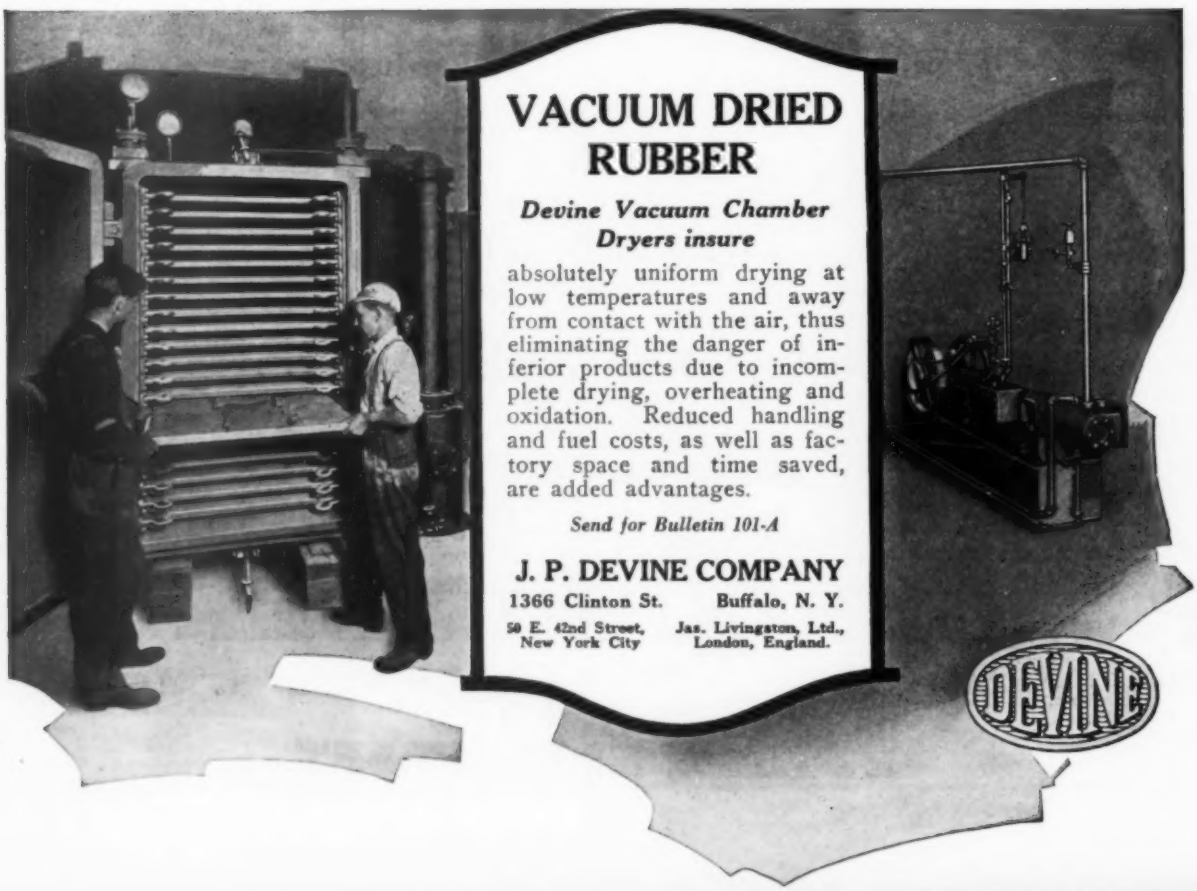
BOSTON
176 Federal Street

WAREHOUSES: HOBOKEN, N. J.



VACUUM DRIED RUBBER

Devine Vacuum Chamber Dryers insure

absolutely uniform drying at low temperatures and away from contact with the air, thus eliminating the danger of inferior products due to incomplete drying, overheating and oxidation. Reduced handling and fuel costs, as well as factory space and time saved, are added advantages.

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Jas. Livingston, Ltd., London, England.

DEVINE

PARA HARD CURE RUBBER

WASHED AND DRIED IN BRAZIL

If you are looking for Quality and Uniformity

ASK FOR

CROWN BRAND RUBBER CREPE

J.G.ARAUJO

MANAOS·BRASIL

COVER YOUR REQUIREMENTS NOW

GET THE RIGHT RUBBER FOR YOUR PRODUCT

It "crowns" the best Crepe in the Market

Packing Standardized Crown Brand Rubber Crepe

Strong Cedar Cases—Free From Splinters

J. G. ARAUJO **MANAOS, BRASIL**

R. T. VANDERBILT CO.

INCORPORATED

50 East 42nd Street, New York

Some features concerning

The Ultra Accelerators

TETRA—METHYL—THIURAM—DISULPHIDE

SUPER-SULPHUR No. 1 **SUPER-SULPHUR No. 2**

Particularly high tensiles may be obtained if such is desirable. The sulphur reaction may be so balanced as to give unusually good heat aging in any article subject to steam, hot water or dry heat.

A compound may be made to give a tensile of 3,000 lbs. at break when cured in a mold either 10 minutes or 10 hours at 40 lbs. steam.

The cumulative effect along with either aniline or ethylidene-aniline is quite appreciable and worth while.

At least twenty softeners or partial solvents for rubber may be used advantageously to prevent scorching and make easier milling.

Either zinc or lead may be used as an activator.

Compounds may be made which will air cure in a few hours, or others, which may remain safely in an uncured state three months.

Open steam cures of about 25 minutes at 20 lbs. pressure give best results on automobile inner tubes.

May be used in cements or in spread goods to give any kind of a cure desired.

Warehouses: Akron, Boston, Chicago, San Francisco, Trenton and Toronto

ONCE—ALWAYS ASK THOSE WHO KNOW FROM 10 YEARS' USE

Peruvian, Egyptian Peeler and Arizona Square Woven and Cord TIRE FABRICS

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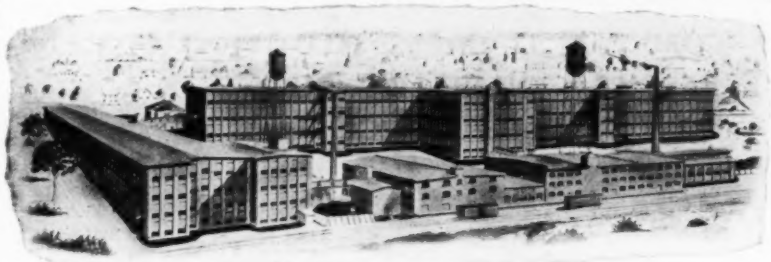
CONNECTICUT MILLS COMPANY MILLS AND OPERATIVES' HOMES

MILLS AT

Danielson, Conn.; Taunton and Fall River, Mass.



CANADIAN CONNECTICUT COTTON MILLS, Limited

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Sorenson & Nielsen

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FAR EASTERN PLANTATIONS
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of

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from
Imported Chalk

AND

PARIS WHITE
from
Genuine English Cliffstone

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FACTORY, BAYONNE, N. J.

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AKRON, OHIO. U. S. A.

Rubber Mill Machinery
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48 x 48—Four Ram Hydraulic Press

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Hand Presses
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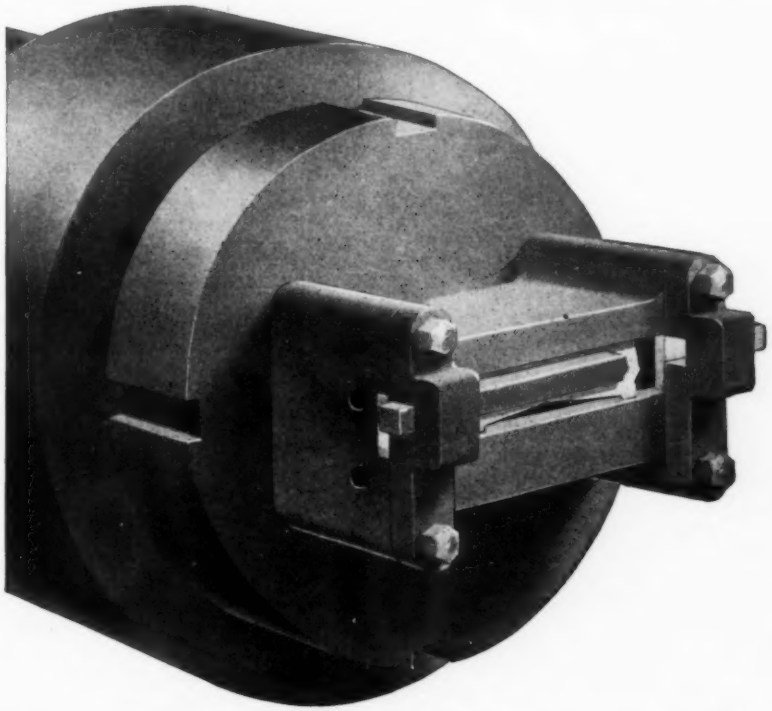

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Our Publicity Page

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Such, probably, was the thought of a subscriber when he recently wrote us the following letter in response to our renewal request upon the expiration of his subscription to THE INDIA RUBBER WORLD:

The India Rubber World,
New York, N. Y.

Gentlemen:

Your valuable letter of June 27, 1923, is now receiving attention. I thank you for all those facts that you have brought before me and another subscription on my part will be a necessity, I dare say.

The paper I take is read by me and kept on file at my office for any who wish to read it, so in explaining the additional subscription which I will send you Monday, I am proud to say it will be for my son, age 14, going to school in Sacramento and interested in chemistry the last year, finding encouragement in such through the friendship of a chemist and his laboratory.

Monday the boy comes down to the city to spend his vacation with me. To insure success and his attention to every page of the paper I intend subscribing to for him, it is policy on my part to talk the matter over with him, thereby instilling a real interest in a study of rubber and its products, that will fit so well with his interest in chemistry.

So after Monday I look forward to the introduction of a rubber boy to THE INDIA RUBBER WORLD.

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Service to the trade is the foundation on which THE INDIA RUBBER WORLD has been built, and for over a third of a century the Editor has sincerely sought to keep both his reading and advertising pages as helpful, just and true as gospel; as comprehensive, accurate and accessible as an encyclopedia; as representative, reliable and clean as a blue book.

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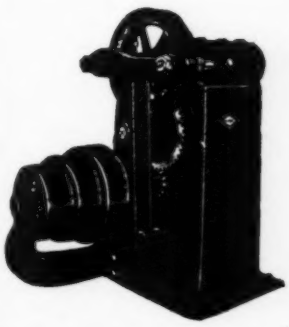

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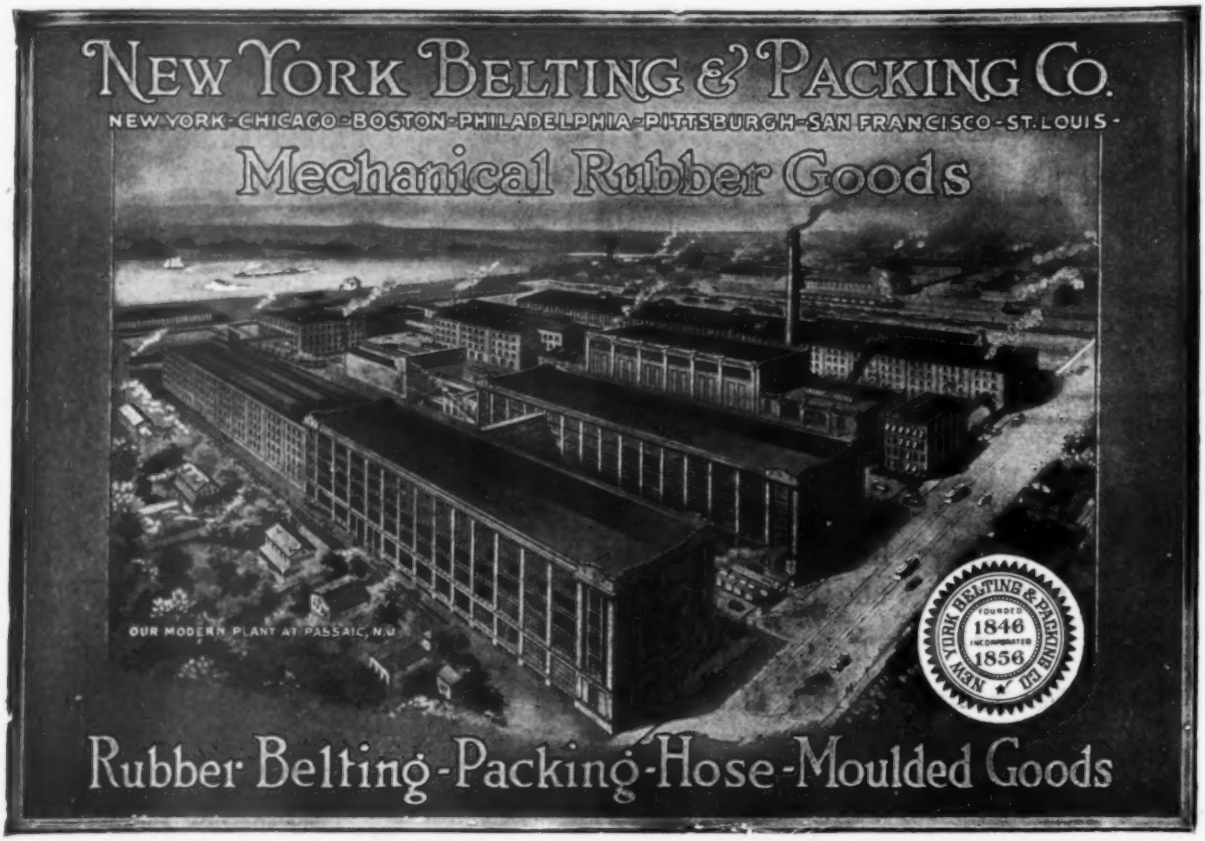
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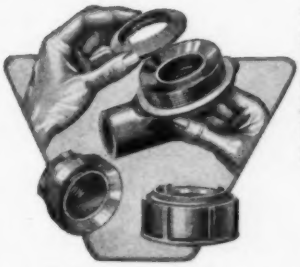

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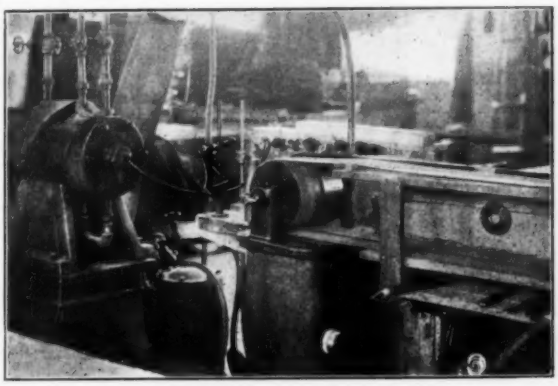

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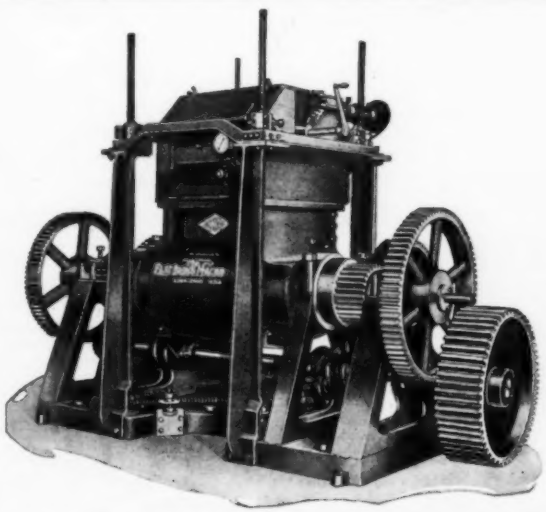

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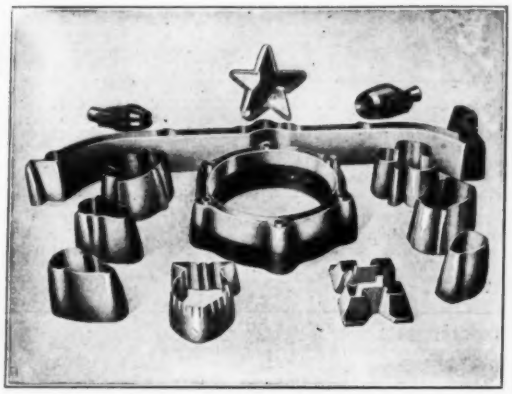

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(Advertisements continued on page 70)

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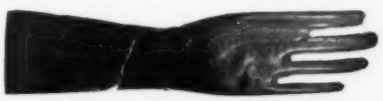


The only porcelain forms manufactured for dipping Rubber Goods which do not craze when passing through either steam or acid cure.

Made by

THE COLONIAL INSULATOR CO., Akron, Ohio

NEW ENGLAND BUTT CO.
PROVIDENCE, R. I.
MANUFACTURERS OF
RUBBER
STRIP COVERING MACHINES
RUBBER
SPREADING MACHINES
RUBBER
HOSE BRAIDERS

CRUDE RUBBER

BALATA—GUTTA PERCHA
LIQUID RUBBER LATEX

GEO. HANKIN & COMPANY
21 Mincing Lane London, E. C. 3.

Cables: Vademecum Outerly } London

Small Advertisement Department—Continued

SITUATIONS OPEN—Continued

WANTED: CAPABLE SUPERINTENDENT WITH KNOWLEDGE OF compounding for rubber mechanical goods factory. State experience, salary, etc., in first letter. Address Box No. 6754, care of THE INDIA RUBBER WORLD.

WANTED: MAN THOROUGHLY EXPERIENCED IN THE MANUfacture of specification tank hose and other mechanical rubber goods. A very good opportunity for right man. Address Box No. 6748, care of THE INDIA RUBBER WORLD.

EXPERIENCED CHEMIST FAMILIAR WITH FORMULAS FOR ALL kinds of rubber cements and compounds. Big opportunity to the right man. U-Glu, Inc., 164 East 35th street, New York City.

WANTED: MILLROOM FOREMAN FOR FACTORY NEAR TRENTON. Must be thoroughly experienced. State details and starting salary requirement in first letter. Address Box No. 6747, care of THE INDIA RUBBER WORLD.

RUBBER MANUFACTURER IN CHICAGO WANTS MAN TO OPERate three-platen Farrel belting press. Must be thoroughly experienced. Will pay expenses West. Good references. Must be permanent. Palmer Asbestos & Rubber Corporation, 80 East Jackson Boulevard, Chicago, Illinois.

BUSINESS OPPORTUNITIES

FOR SALE AT NORTHPORT, LONG ISLAND, 28,000 SQUARE FEET of land adjoining railroad freight yard; 2-story factory building containing over 16,000 square feet with garage 40 by 20 feet. Having moved to larger quarters, owners have no use for this plant. Price $30,000 includes rubber machinery, consisting of electrically equipped calender and mills, boiler house, vulcanizer, etc., suitable for making any class of rubber goods, especially auto tubes and rubber bands. Terms to suit. The Siola Rubber Manufacturing Co., Inc., 84 Forrest street, Brooklyn, N. Y.

FOR RENT: JUST FINISHED. VERY MODERN RUBBER TIRE factory. Two vulcanizers, mill lines, 60-inch calender, two boilers, etc. Address Box No. 6677, care of THE INDIA RUBBER WORLD.

WE HAVE FOR SALE: ENTIRE EQUIPMENT OF A RUBBER PLANT. Will sell at a bargain. L. Albert & Son, 680 N. Olden avenue, Trenton, N. J.

ADVERTISER DESIRES TO COMMUNICATE WITH MANUFACturer of play balls and toys or one who wishes to take up this line. Address Box No. 6634, care of THE INDIA RUBBER WORLD.

FOR SALE: A GOING RUBBER FACTORY EQUIPPED TO MANUfacture inflated toy balls and molded rubber specialties. Address Box No. 6729, care of THE INDIA RUBBER WORLD.

WE HAVE A SMALL PRESS DEPARTMENT IDLE, SUITABLE FOR plumbers' supplies, heels, and other articles of like nature, and will consider renting same to responsible parties or manufacturing for parties who have their own molds. Address Box No. 6726, care of THE INDIA RUBBER WORLD.

BALLOONS. AN OLD ESTABLISHED ENGLISH MANUFACTURER of balloons, doing business with all leading wholesale buyers in Great Britain and Ireland, wishes to buy seamless balloons and airships in all sizes and colors and in silver, gold and mottled. Can buy in very large quantities. Particulars to Thos. Dowler & Co., Ltd., Daw Bank Works, Stockport, England.

AMERICAN FIRM, CONTROLLING THE UNITED STATES AND foreign patents on a wonderful rubber bathing accessory in great demand by women bathers, offers for sale the complete patent rights, as well as patents pending on same, in the following countries: Great Britain, Canada, France and Belgium. Address Box No. 6738, care of THE INDIA RUBBER WORLD.

FOR SALE: MECHANICAL RUBBER PLANT IN NORTHERN INDIana, including a new building with 2,400 square feet of floor space, plenty of land, equipped with boiler, 1 mill, press, pumps, motors, molds, dies, trimmer, office equipment, etc. Price $6,500. Terms can be arranged. Address Box No. 6751, care of THE INDIA RUBBER WORLD.

WANTED—A BUYER

Full patent rights of the most logical orthopedic rubber heel ever marketed including molds and stock at a big sacrifice. Reason for selling; owner lacking working capital and marketing ability to swing proposition.

Address Box No. 6682, care of THE INDIA RUBBER WORLD.

BUSINESS OPPORTUNITIES—Continued

FOR SALE: COMPLETELY EQUIPPED RUBBER AND MANUFACturing plant, situated in the Middle West; four modern buildings of 25,000 square feet floor space; real estate approximately 3½ acres; equipment consisting of calender, mills, spreaders, vulcanizers, and complete equipment all electrically operated; manufacturing buildings, offices, shipping room, stock room, and railway siding included in property. Plant at present in operation and doing annual business of around $300,000. Address Box No. 6733, care of THE INDIA RUBBER WORLD.

AN EXCELLENT OUTLET CAN BE HAD FOR SURPLUS AND DISContinued lines for rubber goods of any description. Can use unlimited quantity of obsolete styles of rubber footwear. Address Box No. 6761, care of THE INDIA RUBBER WORLD.

AN ENTIRELY NEW PROCESS FOR THE MANUFACTURE OF PURE or compounded rubber goods by cold casting, cure preferably by Peachey process, for which Canadian patent has been received, is offered for development in Canada. The writer will be in the United States and Canada early in September, and would like to hear from principals who may be interested. The process is an extremely simple one, requiring inexpensive plant and producing transparent or opaque rubber goods in any form and in any desired color. Address Fordyce Jones, care of THE INDIA RUBBER WORLD.

BALLOON PLANT FOR SALE. GOING OUT OF BUSINESS. FULLY equipped modern plant installed in 1922. "Pattison" ventilating system, 15 "Heitners" dipping machines, tanks and mixers, 140 feet BB Conveyors; "Donleys" 8 suction vento; 9 fireproof dryers; about 75,000 forms and boards. Everything must be sold quickly. Will forward complete inventory on request. Barnard Toy Balloon Co., 2765 West Fort street, Detroit, Michigan.

NEW YORK EXPORT OFFICE: WE WANT TO ACT AS EXPORT office and export managers for rubber manufacturer. We obtain orders in manufacturer's name, attend to shipping, consular invoices, etc. No expense to manufacturer except commission on sales. R. Cram & Co., 7 Water street, New York, N. Y.

FACTORY BUILDING OR RUBBER PLANT—VICINITY NEW YORK—suitable or convertible for manufacture of floor tiles, to rent, option of purchase. Particulars to Box No. 6746, care of THE INDIA RUBBER WORLD.

WANTED: RUBBER MANUFACTURER TO MAKE AND MARKET the following patented swimming specialties; webbed rubber gloves; rubber float; duxfut shoe. Practicability successfully demonstrated. Address Box No. 6756, care of THE INDIA RUBBER WORLD.

MACHINERY AND SUPPLIES FOR SALE

FOR SALE: NEW AND USED RUBBER MACHINERY AND MOTORS, also automobile tire factories all equipped and vacant. Factories not equipped. Address Box No. 6750, care of THE INDIA RUBBER WORLD.

FOR SALE: SPECIAL 12 BY 30-INCH 6-ROLL CALENDER. BEEN used only for experimental purposes and is as good as new. Low price to prompt buyer. Address Box No. 6686, care of THE INDIA RUBBER WORLD.

FOR SALE: ONE FARREL 16-INCH BY 40-INCH MILL
One 12-inch by 36-inch mill
One 60-inch warming mill
Five shoe calenders
Six American 72-inch new spreaders
Two American 200-gallon churns
Two ten-gallon churns
Five Day vertical geared can mixers
One Gramm 40-gallon mixer
One Adamson washer cutter
One Birmingham 72-inch bias cutter
Two dinking machines
Twenty-five vulcanizers
Lots of rubber machinery in fine condition for sale cheap. Address Box No. 6708, care of THE INDIA RUBBER WORLD.

MACHINERY FOR SALE

I have purchased all of the machinery at the plant of the New Jersey Car Spring & Rubber Company, at Jersey City. Have one 60" calender, one 54" calender, three Thropp tire making machines, three Thropp tire wrapping machines, three Thropp tire vulcanizers, one single deck 53" x 25' Farrel Foundry belt press, one 30" x 30" 2 opening press, one 40" x 40" 2 opening press, two accumulators, three hydraulic pumps, 48", 40" and 36" mills, all complete with shafting, two washers and crackers.

Will sell this machinery cheap for cash as it must be moved at once.

Also, have about 75 mills, all size presses, tubing machines, vulcanizers, and practically all kinds of rubber machinery at my storehouse in Trenton.

PHILIP McGRORY

75 Pashley Avenue Trenton, N. J.

(Advertisements continued on page 72)

RECLAIMED RUBBER

HIGH QUALITIES
UNIFORM GRADES
"STANDARDIZED"

VULCAN RECOVERY CO.

Trenton New Jersey

MOLDED RUBBERS FOR THE FURNITURE TRADE

Band Saw Bands
Sanding Machine Rubbers
Rubber Mallets

All these,—and in addition a very complete line of molded mechanical rubber specialties.

ELKHART RUBBER WORKS
ELKHART INDIANA

DAVIDSON RUBBER COMPANY EST. SERVICE SAVINGS SATISFACTION 1857 BANNER BRAND

DAVIDSON RUBBER COMPANY

Boston - - Mass.

Manufacturers of

"THE BANNER LINE OF FAST SELLERS"

DAVIDSON SEAL GUARANTEES QUALITY

Water Bottles, Fountain Syringes and Baby Nipples

BELL PHONE — *The Oldest Rubber Engineering Company in Akron* — CABLE ADDRESS RUBENCO

Rubber Engineering Company

636 Second National Bldg.
AKRON, OHIO

PLANS	We formulate plans and layouts for complete Rubber Plants, furnish designs, construction and specifications.
SPECIFICATIONS	Furnished for buildings, molds, machinery, tires, tubes, etc.
MACHINERY and EQUIPMENT	Designed, built, installed and checked.
PRODUCTION	Systems installed, departments arranged for the economical handling of materials.
ORGANIZATION	Advice and counsel on factory conditions, mechanical and electrical.
APPRAISALS	Made on buildings, equipment, etc., also serve on board of appraisers on per diem basis.
TIRES and TUBES	Designs, molds, complete equipment, compounds, specifications, air bags, etc., for cord and fabric tires and tubes.
ESTIMATES	Given for complete Rubber Plants, mold equipment, presses, etc.
DRAWINGS	Made for special molds, machinery, etc.

Ask about our Monthly Service Proposition

BERGENPORT BRAND

PURE SOFT SULPHUR

PREPARED ESPECIALLY FOR

Rubber Manufacturers

T. & S. C. WHITE CO.

Established 1841

100 William Street NEW YORK

Adolph Hirsch & Co., Inc.

Importers and dealers in

CRUDE RUBBER

OF ALL DESCRIPTIONS

Brazil Maniçoba, and Sheet Rubber, Crude and Washed, Our Specialty.

Direct Receivers of Eastern Plantation Rubber.

53-63 Park Row - New York

Telephone: 2514 Beekman. Cable address: Adhirschco.

BUCKROID

"BuckroiD", the perfect sheet packing. Stays put, weighs less per square yard. Ask us more about this exceptional packing.

The Buckeye Rubber Manufacturing Co.

Willoughby, Ohio

NEW YORK KANSAS CITY CHICAGO

Small Advertisement Department—Continued

MACHINERY AND SUPPLIES FOR SALE—Cont.

FOR SALE: HIGH GRADE STEAM BOILERS. ALL SIZES AND pressures. R. B. Hobson, 230 Valley Road, Montclair, N. J.

FOR SALE: TWO MILLS WITH DRIVE. Address Box No. 6717, care of THE INDIA RUBBER WORLD.

FOR SALE: MILL, MOTOR AND DRIVE, ALSO ROYLE TUBING machines at a bargain. Address Box No. 6715, care of THE INDIA RUBBER WORLD.

FOR SALE: CALENDERS, VULCANIZERS, SKIVING MACHINES, dieing-out machines. Address Box No. 6714, care of THE INDIA RUBBER WORLD.

FOR SALE: HYDRAULIC PRESSES, TUBING MACHINES, HYdraulic pumps, experimental machinery. Address Box No. 6716, care of THE INDIA RUBBER WORLD.

FOR SALE: ONE NEW CAST TOOTH DRIVE GEAR 8-INCH F, 74 T, 2½-inch pitch, 60.47-inch O. D., 58.8-inch P. D. One new front mill roll 16 by 48-inch. Address Box No. 6728, care of THE INDIA RUBBER WORLD.

FOR SALE: ONE MILL LINE WITH FOUR 16 BY 40-INCH T Thropp mills with 150 h. p. reduction gear unit. Four 250-gallon churns, individual overhead drive. Lawrence N. Barry, 156 Cambridge street, Boston, Massachusetts.

FOR SALE: ENTIRELY NEW, FIRST CLASS AND UP-TO-DATE HYdraulic belt vulcanizing press, 25 feet long, 50 inches wide. 3 platens with stretching attachment. 3-throw hydraulic pump, box type accumulator, electric motor and starter, valves and piping. Working pressure one ton per square inch. Makers, David Bridge & Co., Ltd. Photo and full particulars on application. Address Box No. 6721, care of THE INDIA RUBBER WORLD.

FOR SALE: USED MILLS, CALENDERS, CHURNS, TUBING MAchines, vulcanizers, presses, etc., all in fine condition. Write for prices and full descriptions. Address M. Norton & Co., Medford, Massachusetts.

MACHINERY AND SUPPLIES FOR SALE—Cont.

ELECTRICAL EQUIPMENT FOR IMMEDIATE DELIVERY, MILL line motors, 220-volt, 440-volt, 2200-volt. Calender motors, D. C. variable speed. Motor generator sets. Tube machine motors. Most complete stock anywhere. Use our experience. The Electric Motor & Repair Co., Akron, Ohio.

FOR SALE: WERNER & PFLEIDERER MIXERS, ACCUMULATOR. Heavy duty cracker. Address Box No. 6713, care of THE INDIA RUBBER WORLD.

RUBBER MACHINERY FOR SALE. WASHER, CALENDER, MIXING mills, churns, hydraulic presses, spreaders, vulcanizer, mandrels, and other machinery. Will sell very reasonable. Address Box No. 6700, care of THE INDIA RUBBER WORLD.

FOR SALE: 1,000 STEEL TUBE MANDRELS, STANDARD SIZES.
Two horizontal tube vulcanizers, 4 by 12 feet.
One Allen lathe.
Three Thropp lathes.
Two Thropp tape winders.
One tube wrapping machine.
Two Allen skiving machines.
Four iron boiling tanks.
One testing tank, with drip pan.
Address Box No. 6758, care of THE INDIA RUBBER WORLD.

MACHINERY AND SUPPLIES WANTED

FARREL MILLS WANTED: FOUR 20 AND 22 BY 60 FARREL MILLS wanted. Give serial number, condition of equipment and lowest cash price. Address Box No. 6737, care of THE INDIA RUBBER WORLD.

HEEL AND BALL MOLDS WANTED. PARTICULARS AND PRICE to Box No. 6744, care of THE INDIA RUBBER WORLD.

NEW AND SECOND HAND EQUIPMENT FOR SALE

1—37½-75 HP DC Shunt Wound Motor, variable speed, 115-230 volts, complete with push button control. (Westinghouse)
2—50-100 HP DC Shunt Wound Motors, variable speed, 115-230 volts, complete with push button control. (Westinghouse)
2—Type "B" Galt Sprinkler Stokers and Boiler Front for 250 HP boiler.
2—Sectional Vulcanizers.
1—Knight Tire Building Machine.
1—Steam DC Generator Set, 35 KW, 125 Volts, 280 amp. This machine is direct connected to one Robb Armstrong engine; to operate at 100 lbs. pressure. (Westinghouse Generator.)
1—2 HP Motor, 60 cycle, 440 volts, 3 phase, 1135 RPM. (Allis-Chalmers.)
1—72" x 18' 0" H.R.T. Boiler. 90-4" Tubes, 100 lbs. working pressure.
Chain Drive.
Driver—480 R.P.M. 9.050 dia. 19 Teeth.
Driven— 85 R.P.M. 33.46 dia. 70 Teeth.
Driver—Bore 4⅛"
Driven—Bore 6⅛"
Chain —1½" P. x 15" width. 21' 3" long
175 H.P.
1—Westinghouse Induction Motor, type HF., 150 HP., 2,200 volts, 25-cycle, 3-phase, 35 amp. per terminal, 485 R.P.M.
Rotor circuit: 308 volts between rings; 220 amps. per ring.
Serial No. 48,167.
This motor is complete with controller and resistance.
1—500 HP Westinghouse Motor 480 R.P.M., 2,200 volts, 3-phase, 25-cycles. Complete with resistance and starting panel.
1—500 HP Reduction and Magnetic Clutch for above. Line shaft speed 85 R.P.M.

VULCANIZERS. In perfect order.

Diameter	*Stroke*	*Rampot Diameter*
1—4' 10"	8' 2"	13½"
5—3' 10½"	6' 2"	12"
6—3' 10¾"	6' 0"	12"
7—3' 10¾"	5' 11"	12"
8—3' 10¾"	5' 11"	12"

DUNLOP TIRE & RUBBER GOODS CO., Limited,
Toronto, Ontario, Canada. Purchasing Department.

SURPLUS RUBBER MACHINERY

First Class Condition—Prompt Delivery

Birmingham Calenders, three-roll 24"x 66" and 20"x 60", both complete, with reduction gear and 75 H. P. variable speed D. C. motor.
Birmingham Bias Cutter, 100"
American Spreaders, 50" and 100"
Scotch Spreader, 60"
Horizontal Vulcanizers, 60"x 22'
Day Imperial Mixers, No. 40 and No. 10
Triplex Cement Mixers, 50 gal.
Finishing Stands
Cementing Stands
Rag Reelers
Tube Wrappers
Werner & Pfleiderer Washers
78" x 21' hose or belt press, 14, 9" rams, 2 operating lower platens 34" x 21', 1500 ♯ Hyd.
Single and Four-Deck Presses, 24"x 24"
Double Deck Presses, 42"x 42"
Double Deck Presses, 48"x 48"
Mason Regulators, 2"

Let us have your inquiries

By-Products Sales Division—Section AH
THE GOODYEAR TIRE & RUBBER COMPANY
AKRON, OHIO

(*Advertisements continued on page 74*)

SPECIAL MACHINERY

For many years we have made a specialty of developing machinery for the rubber trade. In some instances our designs are followed, in others the designs are furnished by our customers. We solicit your business in this line being confident that our experience and facilities will benefit you.

THE BANNER MACHINE CO.

Columbiana, Ohio

Akron Office, 207 Second National Bldg.

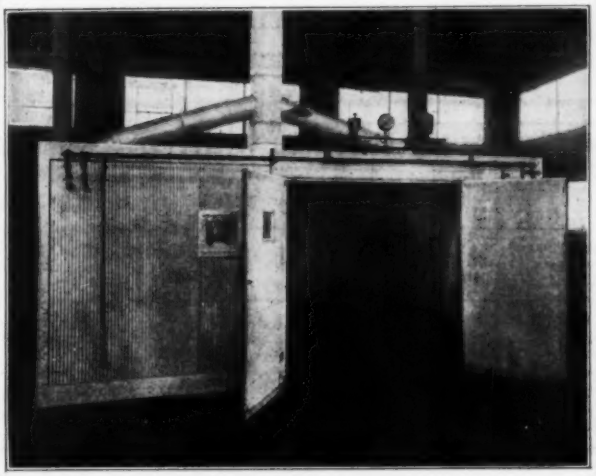
Tire Building Machines *Tire Mold Equipment*

Agents for De Mattia Chuck

"A Guaranteed Rubber Latex"

F. R. HENDERSON & CO., INC. MALATEX New York City

The natural liquid product with a guaranteed minimum of 35% dry rubber. Preserved with ammonia, an effective and harmless anti-coagulant.



A System of Varied Uses

Among the many duties which the Hunter System performs satisfactorily and automatically are:

1. **The rapid and economical drying of all grades of crude rubber without danger of deterioration.**
2. **The perfect drying of chemicals and compounds in their original containers.**
3. **The softening of hard or frozen bales prior to cutting or tearing apart.**
4. **The processing of crude sheets whether washed or unwashed; thereby bringing about an actual improvement in the natural strength and resiliency of the rubber.**

The proper introduction and control of humidity, temperature and circulation makes the success of the above operations absolutely sure.

The advantages of carrying out these operations in one unit, all at the same time if desired, cannot be over-estimated. The natural result is real economy in time and space, with a substantial reduction in labor costs.

Our improved sectional metal kilns, recently placed on the market, are built in sizes to suit all requirements.

An investigation into the advantages of the Hunter System will prove instructive and profitable.

The Hunter Dry Kiln Co.

Home Office and Laboratory

26th St. and Cornell Ave.

Indianapolis, Ind.

European Representatives

FRANCIS SHAW & CO., LTD.

Manchester, England

Small Advertisement Department
—Continued

MACHINERY & SUPPLIES WANTED—Continued

WANTED: ONE MILL 48 INCHES, AND 3 PRESSES, NOT LESS than 30 by 30, with 4 or 5 openings. Particulars and price to Box No. 6745, care of THE INDIA RUBBER WORLD.

WANTED: LARGE TUBING MACHINE, PREFERABLY ROYLE, AT low price; state size, condition, and price. Viscol Co., 700 First street, East Cambridge, Mass.

WANTED: A HIGH SPEED GASKET CUTTING MACHINE FOR cutting rings out of duck and rubber slab stock ½-inch thick. Manufacturers also please note. Address Box No. 6749, care of THE INDIA RUBBER WORLD.

WANTED: DUNNING & BOSCHERT KNUCKLE JOINT PRESSES, size 20 by 20 inches. Tompkins Rubber Manufacturing Co., Tacony, Pennsylvania.

MISCELLANEOUS

RUBBER FORMULAS FOR CORD TIRES COMPLETE, TUBES, SOLID tires, cements, waterproofing and mechanicals. We can furnish formulas for anything in rubber. Also expert advice, engineering and plant equipment. Best of bank references. Write for our complete list. Rubber Compound Bureau, 727 Second National Building, Akron, Ohio.

WE WILL PAY 25 CENTS EACH FOR PERFECT AND complete copies of the following numbers:
1916—October
1917—January, February, and December
1918—January, February, March, April, and June
1921—February
THE INDIA RUBBER WORLD, 25 West 45th Street, New York, N. Y.

WILL SELL *WILL BUY*

Rubber Machinery

We have in stock for immediate delivery standard types of machinery used by rubber manufacturers.

Used Equipment Offered at Attractive Prices

IF YOU NEED MACHINERY OR WISH TO SELL MACHINERY GET IN TOUCH WITH US TODAY.

Mills	Tubing Machines
Calenders	Vacuum Driers
Vulcanizers	Hydraulic Presses

United Rubber Machinery Exchange
49 MARSHALL ST. NEWARK, N. J.

Write, Phone or Wire Your Wants in

RUBBER MACHINERY

We are equipped to give you Service.
Get acquainted with our Exchange Dept.

We pay the Best Prices for

USED MACHINERY

Rubber Machinery & Equipment Co.
102-110 Parkhurst St. Newark, N. J.

We buy and Sell
New and Second-Hand

RUBBER MACHINERY
AND EQUIPMENT

L. ALBERT & SON
680 N. Olden Ave., Trenton, N. J.

IMPROVED

BOTTLE STOPPERS

Made of Rubber, Patented in U. S. and Canada

I have a new bottle stopper and dust cap which can be used with any type of bottle.

It is simple in construction and inexpensive to manufacture.

Suitable for the drug trade and five and ten cent stores.

A practical article with an unlimited sale.

Desire to enter into an arrangement with a manufacturer who will make this product for me.

J. P. McLAURIN
DILLON SOUTH CAROLINA

SCRAP RUBBER FOR SALE

About three hundred tons uncured hose and belt scrap, two hundred tons white rubber ball scrap. Also, other grades of scrap rubber.

PHILIP McGRORY, 75 Pashley Ave., Trenton, N.J.

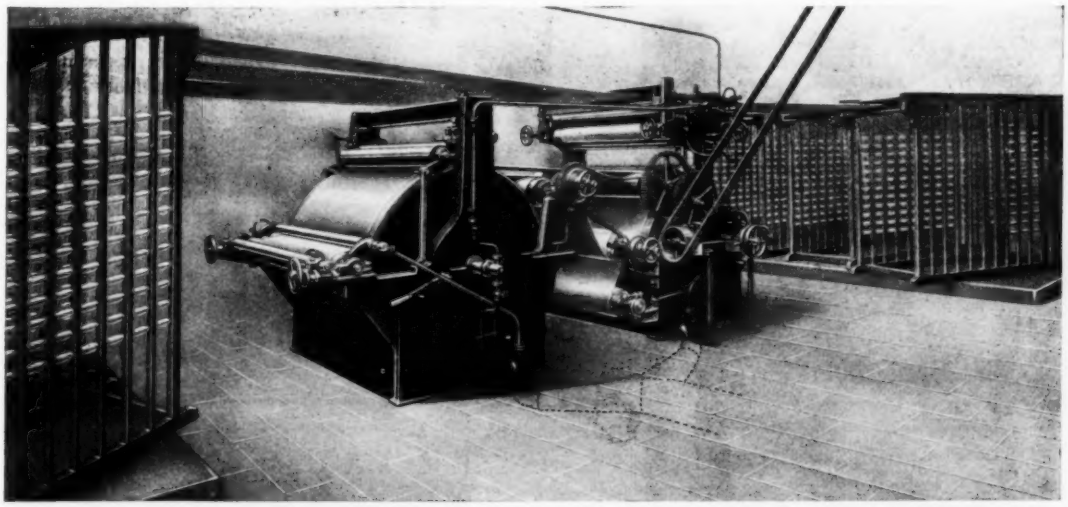
M. NORTON & COMPANY
MEDFORD, MASS.
New, Old, Cured and Uncured Scrap Rubber
ALL KINDS SECOND HAND RUBBER
MILL MACHINERY BOUGHT AND SOLD
Office and Warehouse, Locust Street, Medford, Mass.

"CONTINUOUS MACHINE" for Weaving and Impregnating

Woofless Cord Tyre Fabric for Motor and Cycle Tyres.

Be your own Weaver, Do away with Stocks of Fabric.

The saving in Time, Labour and Material covers the cost of the machine in a few weeks.



Etablissements A. OLIER, *Rubber Engineers,* Clermont-Ferrand & Paris

ARCHER RUBBER CO.

Manufacturers

Royal Archer Lines

Piano and Organ Cloths
Rubber Tubings
Hospital Sheetings and Blankets
Nursery Sheetings and Crib Blankets
Rubber Surface Clothing
Aprons, Ponchos, Rubber Fabrics
Rubberizing for the Trade
Factory and Main Office, MILFORD, MASS.

WATERPROOF COATS

A Quality-Made Raincoat for Wholesale Distribution

Write for Attractive Proposition

BADGER RAINCOAT CO.
Port Washington, Wis.

THE CONSULTING COMPANY

2802 Union Central Building, Cincinnati

Will furnish plans and specifications for your building.
Advise as to machinery and equipment needed.
Supply complete layout of plant.
Superintend entire work of construction.
Mechanical ability of our experts is of the highest order.
Practical knowledge of Rubber manufacturing.

THE CONSULTING COMPANY.

DRYERS AND WATER SEPARATORS

FOR

RECLAIMED RUBBER

PRODUCES HIGHER GRADE MATERIAL AT LOWER COST AND MORE EFFICIENT.

Material Carried in Stock for Standard Sizes

AMERICAN PROCESS CO.
68 WILLIAM ST., N. Y. CITY.

NEARPARA RUBBER CO.
TRENTON, NEW JERSEY
Reclaimed Rubber Manufacturers

BRANDS	FOR USE IN
"HUDSON"	Hard Rubber Goods, Etc.
"POTOMAC"	Insulated Wire, Etc.
"POTOMAC A"	Hospital Sheeting, Soles, Heels, Etc.
"MERRIMAC"	Molded Goods and Insulated Wire, Etc.
"DELAWARE"	Druggist Sundries, Etc.
"ST. LAWRENCE"	Ins. Wire, Auto Tire Friction, Etc.

All "NEARPARA" Stocks uniform and contain a high percentage of rubber

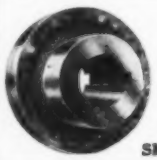
The Atlas Chemical Co.
WALTHAM, MASS.
MANUFACTURERS OF
ATLAS
SULPHURET OF ANTIMONY
FOR THE RUBBER TRADE
SINCE 1880

Manufacturers of
COTTON FLOCK
THE PECKHAM MFG. CO. 236-244 South Street, Newark, N. J.

NEW JERSEY RUBBER COMPANY
EXPERT RECLAIMERS OF TIRE FRICTIONS
LAMBERTVILLE, NEW JERSEY

J. Frank Dunbar Co., Inc.
113-115 BROAD STREET
NEW YORK CITY
Crude Rubber and Allied Gums
BOSTON, MASS., 166 Essex St.
AKRON, OHIO, 603 Flat Iron Bldg.

R. L. CHIPMAN
Broker in Crude Rubber, Gutta Percha and Allied Gums
23-25 BEAVER STREET NEW YORK



FRANCKE FLEXIBLE COUPLINGS
Provide for the unavoidable errors of setting up direct-connected machinery and prevent bearing and shaft troubles due to the inevitable misalignments of operation. All sizes.
SMITH & SERRELL, 38 Central Ave., Newark, N. J.

STEEL MOLDS

Recognizing the advantages of steel and the tendency towards the adoption of it, Franz pioneered in the production of steel tire molds.

That Franz has been preeminently successful in the production of steel molds at a minimum cost is evident. Tire manufacturers are turning to Franz for their requirements. They have come to consider Franz as steel mold headquarters.

Franz tread engraving in steel is perfect in detail. For accuracy and for speed in turning out the work, Franz work is without a par.

THE FRANZ FOUNDRY & MACHINE CO.
FACTORY: BARBERTON AKRON, OHIO
C. FRANZ, President J. K. WILLIAMS, Vice-President C. W. FRANZ, Vice-President and Sales Manager

COMPLETE RUBBER WORKING EQUIPMENT

From a Nut Tightener Weighing 40 Lbs.
To a Mill or Calender Weighing 40 Tons

IF IT'S FOR WORKING RUBBER

Send Your Inquiries To

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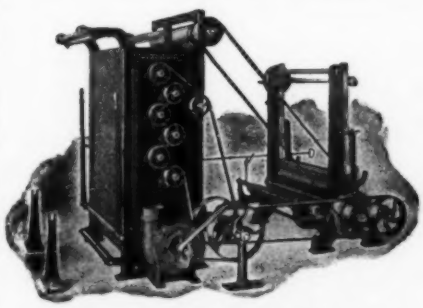

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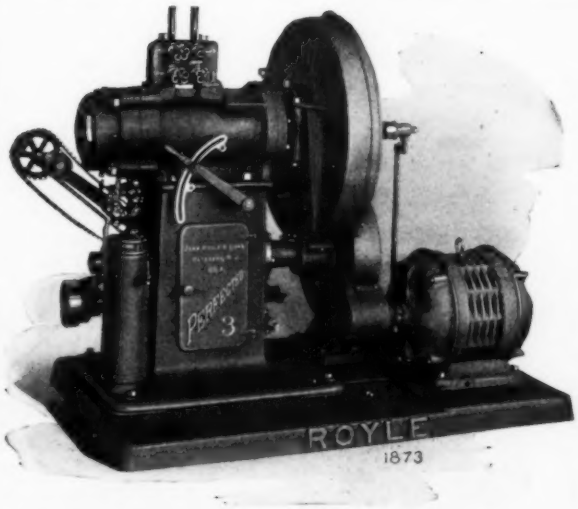

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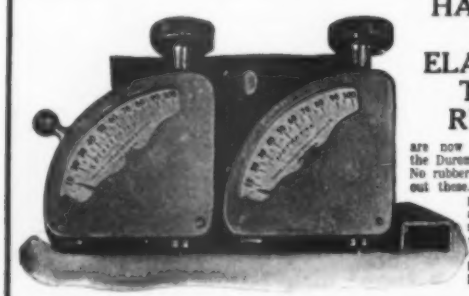

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Canfield Rubber Co., Bridgeport, Conn.
Cincinnati Rubber Mfg. Co., Cincinnati, O.
Davol Rubber Co., Providence, R. I.
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Essex Rubber Co., Trenton, N. J.
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Gutta Percha & Rubber Mfg. Co., New York.
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Home Rubber Co., Trenton, N. J.
Manhattan Rubber Mfg. Co., Passaic, N. J.
New York Belting & Packing Co., N. Y.
New York Rubber Co., New York.
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Quaker City Rubber Co., Phila., Pa.
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Siola Rubber Mfg. Co., Inc., The, New York.
Stokes, Joe., Rubber Co., Trenton, N. J.
Thermoid Rubber Co., Trenton, N. J.
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Voorhees Rubber Mfg. Co., Jersey City.
Western Rubber Co., Goshen, Ind.
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Manhattan Rubber Mfg. Co., Passaic, N. J.
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New York Belting & Packing Co., New York.
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North British Rubber Co., Ltd., Edinburgh, Scotland.
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Voorhees Rubber Mfg. Co., Jersey City, N. J.
Whitehead Bros. Rubber Co., Trenton, N. J.

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North British Rubber Co., Ltd., Edinburgh, Scotland.

Billiard Cushions.

Boston Belting Co., Boston, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Cincinnati R. M. Co., Cincinnati, O.
Gutta Percha & Rubber Mfg. Co., N. Y.
Manhattan Rubber Mfg. Co., Passaic, N. J.
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New York Rubber Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
United States Rubber Co., New York.

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Manhattan Rubber Mfg. Co., Passaic, N. J.
North British Rubber Co., Ltd., Edinburgh, Scotland.
United States Rubber Co., New York.
Voorhees Rubber Mfg. Co., Jersey City, N. J.

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Thermoid Rubber Co., Trenton, N. J.
Woven Steel Hose & Rubber Co., Trenton, N. J.

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Siola Rubber Mfg. Co., Inc., The, New York.
Western Rubber Co., Goshen, Ind.

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Canfield Rubber Co., Bridgeport, Conn.
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Home Rubber Co., Trenton, N. J.
Manhattan Rubber Mfg. Co., Passaic N. J.
New York Belting & Packing Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Quaker City Rubber Co., Philadelphia.
Siola Rubber Mfg. Co., Inc., The, New York.
Thermoid Rubber Co., Trenton, N. J.
United States Rubber Co., New York.
Voorhees Rubber Mfg. Co., Jersey City.
Western Rubber Co., Goshen, Ind.
Whitehead Bros. Rubber Co., Trenton, N. J.

Card Cloths.

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
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Boston Woven Hose & Rubber Co., Cambridge, Mass.
Buckeye Rubber Mfg. Co., The, Willoughby, Ohio.
Canfield Rubber Co., Bridgeport, Conn.
Davol Rubber Co., Providence, R. I.
Gutta Percha and Rubber, Limited, Toronto, Canada.
Gutta Percha & Rubber Mfg. Co., N. Y.
Manhattan Rubber Mfg. Co., Passaic, N. J.
New York Belting & Packing Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Quaker City Rubber Co., Philadelphia.
Siola Rubber Mfg. Co., Inc., The, New York.
United States Rubber Co., New York.
Voorhees Rubber Mfg. Co., Jersey City.
Western Rubber Co., Goshen, Ind.

Door Springs.

Canfield Rubber Co., Bridgeport, Conn.
Manhattan Rubber Mfg. Co., Passaic, N. J.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Siola Rubber Mfg. Co., Inc., The, New York.

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Manhattan Rubber Mfg. Co., Passaic, N. J.
Siola Rubber Mfg. Co., Inc., The, New York.

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Stedman Products Co., South Braintree, Mass.

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Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Canfield Rubber Co., Bridgeport, Conn.
Cincinnati Rubber Mfg. Co., Cincinnati, Ohio.
Gutta Percha and Rubber, Limited, Toronto, Canada.
Manhattan Rubber Mfg. Co., Passaic, N. J.
New York Belting & Packing Co., N. Y.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Rubber Products Co., Barberton, O.
Siola Rubber Mfg. Co., Inc., The, New York.
United States Rubber Co., New York.
Western Rubber Co., Goshen, Ind.

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Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Davol Rubber Co., Providence, R. I.
Hodgman Rubber Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Seamless Rubber Co., Inc., The, New Haven, Conn.
Tyer Rubber Co., Andover, Mass.
Voorhees Rubber Mfg. Co., Jersey City.

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Boston Belting Co., Boston, Mass.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Buckeye Rubber Mfg. Co., The, Willoughby, Ohio.

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Gutta Percha & Rubber Mfg. Co., New York.
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New York Belting & Packing Co., New York.
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North British Rubber Co., Ltd., Edinburgh, Scotland.
Quaker City Rubber Co., Philadelphia, Pa.
Siola Rubber Mfg. Co., Inc., The, New York.
United States Rubber Co., New York.
Voorhees Rubber Mfg. Co., Jersey City, N. J.
Western Rubber Co., Goshen, Ind.

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New York Belting & Packing Co., N. Y.
United States Rubber Co., New York.
Voorhees Rubber Mfg. Co., Jersey City.

Horse Shoe Pads.

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Murray Rubber Co., Trenton, N. J.
New York Belting & Packing Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
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United States Rubber Co., New York.
Voorhees Rubber Mfg. Co., Jersey City, N. J.
Western Rubber Co., Goshen, Ind.
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Gutta Percha & Rubber Mfg. Co., N. Y.
Manhattan Rubber Mfg. Co., Passaic, N. J.
N. Y. Belting & Packing Co., New York.
Southwark Foundry & Machine Co., Philadelphia, Pa.
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Fabric Fire Hose Co., New York.
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Gutta Percha and Rubber, Limited, Toronto, Canada.
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Manhattan Rubber Mfg. Co., Passaic, N. J.
New York Belting & Packing Co., N. Y.
New York Rubber Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Quaker City Rubber Co., Philadelphia.
Stokes, Jos., Rubber Co., Trenton, N. J.
United States Rubber Co., New York.
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Whitehead Bros. Rubber Co., Trenton, N. J.
Woven Steel Hose & Rubber Co., Trenton, N. J.

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Boston Woven Hose & Rubber Co., Cambridge, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Gutta Percha and Rubber, Limited, Toronto, Canada.
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Manhattan Rubber Mfg. Co., Passaic, N. J.
New York Belting & Packing Co., New York.
Quaker City Rubber Co., Philadelphia.
United States Rubber Co., New York.
Voorhees Rubber Mfg. Co., Jersey City.

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Boston Woven Hose & Rubber Co., Cambridge, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.

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Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Gutta Percha and Rubber, Limited, Toronto, Canada.
Manhattan Rubber Mfg. Co., Passaic, N. J.
New York Belting & Packing Co., N. Y.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Quaker City Rubber Co., Philadelphia, Pa.
United States Rubber Co., New York.
Voorhees Rubber Mfg. Co., Jersey City, N. J.
Western Rubber Co., Goshen, Ind.

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Boston Belting Co., Boston, Mass.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Buckeye Rubber Mfg. Co., The, Willoughby, Ohio.
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Cincinnati R. M. Co., Cincinnati, O.
Essex Rubber Co., Trenton, N. J.
Gutta Percha & Rubber, Ltd., Toronto Canada.
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Manhattan Rubber Mfg. Co., Passaic N. J.
New York Belting & Packing Co., N. Y
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North British Rubber Co., Ltd., Edinburgh, Scotland.
Quaker City Rubber Co., Philadelphia Pa.
Siola Rubber Mfg. Co., Inc., The, New York.
United States Rubber Co., New York.
Voorhees Rubber Mfg. Co., Jersey City
Western Rubber Co., Goshen, Ind.

Mold Work.

(See Mechanical Rubber Goods.)

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Boston Belting Co., Boston, Mass.
Buckeye Rubber Mfg. Co., The, Willoughby, Ohio.
Canfield, H. O., Co., Bridgeport, Conn
Canfield Rubber Co., Bridgeport, Conn
Cincinnati R. M. Co., Cincinnati, O.
Davidson Rubber Co., Boston, Mass.

Mold Work—Continued.

Davol Rubber Co., Providence, R. I.
Elkhart Rubber Works, Elkhart, Ind.
Essex Rubber Co., Trenton, N. J.
Firestone Tire & Rubber Co., Akron Ohio.
Gutta Percha & Rubber Mfg. Co., New York.
Gutta Percha & Rubber, Ltd., Toronto.
Hale, Alfred, Rubber Co., Atlantic, Mass
Hewitt Rubber Co., Buffalo, N. Y.
Home Rubber Co., Trenton, N. J.
Manhattan Rubber Mfg. Co., Passaic, N. J.
New York Belting & Packing Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Quaker City Rubber Co., Philadelphia.
Rubber Products Co., Barberton, O.
Siola Rubber Mfg. Co., Inc., The, New York.
Tyer Rubber Co., Andover, Mass.
United States Rubber Co., New York.
Voorhees Rubber Mfg. Co., Jersey City, N. J.
Western Rubber Co., Goshen, Ind.
Whitall Tatum Co., New York.

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Boston Woven Hose & Rubber Co., Cambridge, Mass.
Canadian Consolidated Rubber Co., Ltd. Montreal, Canada.
Cincinnati Rubber Mfg. Co., Cincinnati, Ohio.
Gutta Percha and Rubber, Limited, Toronto, Canada.
Gutta Percha & Rubber Mfg. Co., N. Y
Hewitt Rubber Co., Buffalo, N. Y.
Home Rubber Co., Trenton, N. J.
Manhattan Rubber Mfg. Co., Passaic, N. J.
New York Belting & Packing Co., N. Y
Quaker City Rubber Co., Philadelphia, Pa.
United States Rubber Co., New York.
Voorhees Rubber Mfg. Co., Jersey City
Western Rubber Co., Goshen, Ind.
White, S. S. Dental Mfg. Co., The, Philadelphia, Pa.

Packing.

(See Mechanical Rubber Goods.)

Boston Belting Co., Boston, Mass.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Buckeye Rubber Mfg. Co., The, Willoughby, Ohio.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Cincinnati Rubber Mfg. Co., Cincinnati, O.
Elkhart Rubber Works, Elkhart, Ind.
Essex Rubber Co., Trenton, N. J.
Gutta Percha and Rubber, Limited, Toronto, Canada.
Gutta Percha & Rubber Mfg. Co., New York.
Hewitt Rubber Co., Buffalo, N. Y.
Home Rubber Co., Trenton, N. J.
Manhattan Rubber Mfg. Co., Passaic, N. J.
New York Belting & Packing Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Quaker City Rubber Co., Philadelphia, Pa.
Siola Rubber Mfg. Co., Inc., The, New York.
United States Rubber Co., New York.
Voorhees Rubber Mfg. Co., Jersey City, N. J.
Western Rubber Co., Goshen, Ind.
Whitehead Bros. Rubber Co., Trenton, N. J.

Paper Machine Rolls and Deckle Straps.

Boston Belting Co., Boston, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Farrel Foundry & Machine Co., Ansonia, Conn.
Gutta Percha & Rubber Mfg. Co., N. Y.
Manhattan Rubber Mfg. Co., Passaic, N. J.
New York Belting & Packing Co., N. Y.
North British Rubber Co., Ltd., Edinburgh, Scotland.
United States Rubber Co., New York.
Voorhees Rubber Mfg. Co., Jersey City.

Plumbers' Supplies.

Force Cups, Fuller Balls.

Acme Rubber Mfg. Co., Trenton, N. J.
Buckeye Rubber Mfg. Co., The, Willoughby, Ohio.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Canfield Co., H. O., Bridgeport, Conn.
Canfield Rubber Co., Bridgeport, Conn.
Cincinnati Rubber Mfg. Co., Cincinnati, Ohio.
Davol Rubber Co., Providence, R. I.
Elkhart Rubber Works, Elkhart, Ind.
Essex Rubber Co., Trenton, N. J.
Gutta Percha and Rubber, Limited, Toronto, Canada.
Hodgman Rubber Co., New York.
Home Rubber Co., Trenton, N. J.
New York Belting & Packing Co., N. Y.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Quaker City Rubber Co., Philadelphia, Pa.
Rubber Products Co., Barberton, O.
Siola Rubber Mfg. Co., Inc., The, New York.
United States Rubber Co., New York.
Western Rubber Co., Goshen, Ind.

Rolls—Rubber Covered.

Acme Rubber Mfg. Co., Trenton, N. J.
Boston Belting Co., Boston, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Cincinnati R. M. Co., Cincinnati, O.
Gutta Percha and Rubber, Limited, Toronto, Canada.
Gutta Percha & Rubber Mfg. Co., N. Y.
Home Rubber Co., Trenton, N. J.
Manhattan Rubber Mfg. Co., Passaic, N. J.
New York Belting & Packing Co., N. Y.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Quaker City Rubber Co., Philadelphia, Pa.
United States Rubber Co., New York.
Voorhees Rubber Mfg. Co., Jersey City, N. J.
Western Rubber Co., Goshen, Ind.

Sewing Machine Rubbers.

Canfield Rubber Co., Bridgeport, Conn.
Manhattan Rubber Mfg. Co., Passaic, N. J.
Siola Rubber Mfg. Co., Inc., The, New York.
Western Rubber Co., Goshen, Ind.

Specialties.

Davol Rubber Co., Providence, R. I.
Manhattan Rubber Mfg. Co., Passaic, N. J.
Siola Rubber Mfg. Co., Inc., The, New York.

Tiling.

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Gutta Percha and Rubber, Limited, Toronto, Canada.
Hewitt Rubber Co., Buffalo, N. Y.
New York Belting & Packing Co., N. Y.
North British Rubber Co., Ltd., Edinburgh.
Stedman Products Co., South Braintree, Mass.
Voorhees Rubber Mfg. Co., Jersey City.
Western Rubber Co., Goshen, Ind.

For Complete Addresses See Advertisements—Index Page 112

CARBON BLACK

An inert pigment which smoothes and toughens tire compounds and materially lessens claims for adjustments.

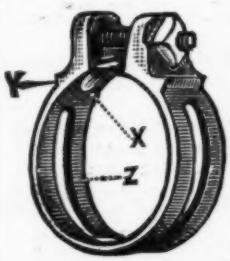
Equally adapted to other compounds where durability and resiliency are required.

SEAVER & CO. Established 1882 — 3 TREMONT ROW, Olympia Bldg. BOSTON, MASS.

SELF SEALER WRAPPING MACHINE
VERY SPEEDY - Completely Seals - Roller Bearings
WRAPS AVERAGE TIRE IN ABOUT
15—SECONDS—15
SAVES PAPER — CANNOT UNRAVEL
Revolving shuttle is hollow and filled with glue. Paper runs over a small roller moving same. At the edge extra roller that runs in glue distributes same along edge of paper. This makes completely sealed package.
Write for Information & Prices One of 8 kinds Sold Outright
Also makers of tire making and repair equipment. Established 1894.
CHARLES E. MILLER
ANDERSON RUBBER WORKS
Sales Dept.: 1410 Meridian Street
MILLER'S NO 386 ANDERSON, IND., U. S. A.

Materials
for
Rubber Industries
THE
H. J. ADAMS COMPANY
Second National Building AKRON, OHIO

You Get the Biggest Return



In all the desirable elements of Hose Service when you buy "YERDON'S" CAST BRASS HOSE BANDS.

Made of a Special, RUST-PROOF, composition metal, exceptionally strong and durable, they hold the hose firmly with a double, all-around "Grip" assuring a permanently tight connection. They can be used repeatedly and will be right on the job doing Efficient work long after others are scrapped and forgotten.

ALL sizes for hose ¾" O. D. up to the largest Suction Hose. Most satisfactory on automobile hose connections. Made in Fort Plain, U. S. A. Used everywhere. Unequalled by any.

We solicit your stock orders. If you don't know them write for samples. Both Home and Foreign trade supplied.

WILLIAM YERDON, Dept. C, Fort Plain, N. Y.

The
CENTRAL RUBBER RECLAIMING
COMPANY

Frictions Reclaimed
Auto Tire Reclaims

DEFIANCE OHIO

Seamless
A mark of quality on rubber goods since 1877

Rubber Druggists' Sundries
Rubber Toys and Novelties
Rubber Sporting Goods
Bathing Caps
Zinc Oxide Adhesive Plaster
Surgical Supplies
Surgeons' Gloves
Household Gloves
Industrial Gloves
Tubing
Nipples
Hard Rubber Combs

The Seamless Rubber Co., Inc.
NEW HAVEN, CONNECTICUT
Send for Catalogue

RUBBER BUYERS' DIRECTORY—Continued.

Tubing.

(See Mechanical Rubber Goods.)

Acme Rubber Mfg. Co., Trenton, N. J.
American Hard Rubber Co., New York.
Archer Rubber Co., Milford, Mass.
Boston Belting Co., Boston, Mass.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Buckeye Rubber Mfg. Co., The, Willoughby, Ohio.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Canfield Rubber Co., Bridgeport, Conn.
Cincinnati R. M. Co., Cincinnati, O.
Davidson Rubber Co., Boston, Mass.
Davol Rubber Co., Providence, R. I.
Essex Rubber Co., Trenton, N. J.
Faultless Rubber Co., Ashland, Ohio.
Gutta Percha & Rubber, Ltd., Toronto, Canada.
Gutta Percha & Rubber Mfg. Co., New York.
Hodgman Rubber Co., New York.
Home Rubber Co., Trenton, N. J.
Manhattan Rubber Mfg. Co., Passaic, N. J.
New York Belting & Packing Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Quaker City Rubber Co., Philadelphia, Pa.
Rubber Products Co., Barberton, O.
Seamless Rubber Co., Inc., The, New Haven, Conn.
Siola Rubber Mfg. Co., Inc., The, New York.
Tyer Rubber Co., Andover, Mass.
United States Rubber Co., New York.
Voorhees Rubber Mfg Co., Jersey City, N. J.
Western Rubber Co., Goshen, Ind.
Whitall Tatum Co., New York.
Whitehead Bros. Rubber Co., Trenton, N. J.

Valve Discs.

American Hard Rubber Co., New York.
Boston Belting Co., Boston, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Canfield Rubber Co., Bridgeport, Conn.
Cincinnati R. M. Co., Cincinnati, O.
Gutta Percha and Rubber, Limited, Toronto, Canada.
Hewitt Rubber Co., Buffalo, N. Y.
Home Rubber Co., Trenton, N. J.
Manhattan Rubber Mfg. Co., Passaic, N. J.
New York Belting & Packing Co., N. Y.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Quaker City Rubber Co., Philadelphia, Pa.
Seamless Rubber Co., Inc., The, New Haven, Conn.
Siola Rubber Mfg. Co., Inc., The, New York.
United States Rubber Co., New York.
Western Rubber Co., Goshen, Ind.

Valves.

(See Mechanical Rubber Goods.)

Boston Belting Co., Boston, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Canfield Rubber Co., Bridgeport, Conn.
Elkhart Rubber Works, Elkhart, Ind.
Essex Rubber Co., Trenton, N. J.
Gutta Percha & Rubber Mfg. Co., New York.
Gutta Percha and Rubber, Limited, Toronto, Canada.
Hewitt Rubber Co., Buffalo, N. Y.
Manhattan Rubber Mfg. Co., Passaic, N. J.
New York Belting & Packing Co., New York.
New York Rubber Co., New York.

Valves—Continued.

North British Rubber Co., Ltd., Edinburgh, Scotland.
Quaker City Rubber Co., Philadelphia, Pa.
Siola Rubber Mfg. Co., Inc., The, New York.
United States Rubber Co., New York.
Voorhees Rubber Mfg. Co., Jersey City, N. J.
Western Rubber Co., Goshen, Ind.
Whitehead Bros. Rubber Co., Trenton, N. J.

Valves—Balata.

Boston Belting Co., Boston, Mass.

Valve Balls—Condensor, Cold and Hot Water.

Boston Belting Co., Boston, Mass.
Hewitt Rubber Co., Buffalo, N. Y.
Home Rubber Co., Trenton, N. J.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Quaker City Rubber Co., Philadelphia, Pa.
Siola Rubber Mfg. Co., Inc., The, New York.
Western Rubber Co., Goshen, Ind.

Vulcanized Emery Wheels.

Manhattan Rubber Mfg. Co., Passaic, N. J.
New York Belting & Packing Co., New York. (Vulcanite.)
United States Rubber Co., New York.

Wringer Rolls.

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Cincinnati R. M. Co., Cincinnati, O.
Gutta Percha and Rubber, Limited, Toronto.
New York Belting & Packing Co., N. Y.
North British Rubber Co., Ltd., Edinburgh, Scotland.
United States Rubber Co., New York.
Western Rubber Co., Goshen, Ind.

DRUGGISTS' AND STATIONERS' SUNDRIES.

Atomizers. Nipples.
Bandages. Syringes.
Bulbs. Water Bottles

Druggists' Sundries, Generally

American Hard Rubber Co., New York.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Davidson Rubber Co., Boston, Mass.
Davol Rubber Co., Providence, R. I.
Faultless Rubber Co., Ashland, Ohio.
Hodgman Rubber Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Pirelli, Milan, Italy.
Rubber Products Co., Barberton, O.
Seamless Rubber Co., Inc., New Haven, Conn.
Siola Rubber Mfg. Co., Inc., The, New York.
Tyer Rubber Co., Andover, Mass.
United States Rubber Co., New York.
Vulcanized Rubber Co., New York.
Whitall Tatum Co., New York.

Air Goods.

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Davol Rubber Co., Providence, R. I.
Hodgman Rubber Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Seamless Rubber Co., Inc., New Haven, Conn.
Siola Rubber Mfg. Co., Inc., The, New York.
Tyer Rubber Co., Andover, Mass.
United States Rubber Co., New York.
Whitall Tatum Co., N. Y.

Air Goods—Valves for.

Schrader's, A., Son, Inc., New York.

Balloons (Toy).

Faultless Rubber Co., Ashland, Ohio.

Balls, Dolls and Toys.

Canadian Consolidated Rubber Co., Ltd., Montreal, Can.
Essex Rubber Co., Trenton, N. J.
Faultless Rubber Co., Ashland, Ohio.
New York Rubber Co., New York.
Seamless Rubber Co., Inc., The, New Haven, Conn.
United States Rubber Co., New York.

Bathing Caps.

Canfield Rubber Co., Bridgeport, Conn.
Davol Rubber Co., Providence, R. I.
Faultless Rubber Co., Ashland, Ohio.
Hodgman Rubber Co., New York.
Kleinert, I. B., Rubber Co., The, New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Seamless Rubber Co., Inc., New Haven, Conn.
Siola Rubber Mfg. Co., Inc., The, New York.
Tyer Rubber Co., Andover, Mass.
United States Rubber Co., New York.

Bulbs.

Davol Rubber Co., Providence, R. I.
Faultless Rubber Co., Ashland, Ohio.
Seamless Rubber Co., Inc., New Haven, Conn.
Siola Rubber Mfg. Co., Inc., The, New York.
Tyer Rubber Co., Andover, Mass.
United States Rubber Co., New York.
Whitall Tatum Co., New York.

Combination Fountain Syringe and Hot Water Bottle Fixtures.

Brass Goods Mfg. Co., Brooklyn, N. Y.
Schrader's, A., Son, Inc., New York.

Combs.

American Hard Rubber Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Seamless Rubber Co., Inc., The, New Haven, Conn.
Vulcanized Rubber Co., New York.

Elastic Bands.

Davol Rubber Co., Providence, R. I.
Easthampton Rubber Thread Co., Easthampton, Mass.
Hodgman Rubber Co., New York.
Seamless Rubber Co., Inc., New Haven, Conn.
Siola Rubber Mfg. Co., Inc., The, New York.
Tyer Rubber Co., Andover, Mass.
United States Rubber Co., New York.

Electricians' and Surgeons' Gloves.

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Davol Rubber Co., Providence, R. I.
Faultless Rubber Co., Ashland, Ohio.
Hodgman Rubber Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Rubber Products Co., Barberton, O.
Seamless Rubber Co., Inc., New Haven, Conn.
United States Rubber Co., New York.

Erasive Rubbers.

Faultless Rubber Co., Ashland, Ohio.
North British Rubber Co., Ltd., Edinburgh, Scotland.

Finger Cots.

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Davol Rubber Co., Providence.
Faultless Rubber Co., Ashland, Ohio.
Rubber Products Co., The, Barberton, O.

Finger Cots—Continued

Seamless Rubber Co., Inc., New Haven, Conn.
United States Rubber Co., New York.
Whitall Tatum Co., N. Y.

Fountain Syringes

Davidson Rubber Co., Boston, Mass.
Davol Rubber Co., Providence, R. I.
Faultless Rubber Co., Ashland, Ohio.
Hodgman Rubber Co., New York.
Seamless Rubber Co., Inc., The, New Haven, Conn.
Tyer Rubber Co., Andover, Mass.
United States Rubber Co., New York.

Hard Rubber Goods.

American Hard Rubber Co., New York.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Connecticut Hard Rubber Co., The, New Haven, Conn.
Davol Rubber Co., Providence, R. I.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Seamless Rubber Co., Inc., New Haven, Conn.
Stokes, Joseph, Rubber Co., Trenton, N. J.
Tyer Rubber Co., Andover, Mass.
United States Rubber Co., New York.
Vulcanized Rubber Co., New York.
White, S. S. Dental Mfg. Co., The, Philadelphia, Pa.

Hospital Sheetings.

Archer Rubber Co., Milford, Mass.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Hale, Alfred, Rubber Co., Atlantic, Mass.
Hodgman Rubber Co., New York.
Kleinert, I. B., Rubber Co., The, New York.
Meade Rubber Co., Stoughton, Mass.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Plymouth Rubber Co., Inc., Canton, Mass.
Seamless Rubber Co., Inc., The, New Haven, Conn.
Siola Rubber Mfg. Co., Inc., The, New York.
Tyer Rubber Co., Andover, Mass.
United States Rubber Co., New York.

Hot Water Bottle Stoppers.

Schrader's, A., Sons, Inc., New York.

Hot Water Bottles, Throat Bags, Ice Bags and Ice Bag Caps.

Brass Goods Mfg. Co., Brooklyn, N. Y.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Davidson Rubber Co., Boston, Mass.
Davol Rubber Co., Providence, R. I.
Faultless Rubber Co., Ashland, Ohio.
Hodgman Rubber Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Rubber Products Co., The, Barberton, O.
Schrader's, A., Son, Inc., Brooklyn, N. Y.
Seamless Rubber Co., Inc., New Haven, Conn.
Tyer Rubber Co., Andover, Mass.
United States Rubber Co., New York.
Whitall Tatum Co., N. Y.

Life Preservers.

Davol Rubber Co., Providence, R. I.
Hodgman Rubber Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
United States Rubber Co., New York.

Nipples.

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Davidson Rubber Co., Boston, Mass.
Davol Rubber Co., Providence, R. I.
Faultless Rubber Co., Ashland, Ohio.
North British Rubber Co., Ltd., Edinburgh, Scotland.

For Complete Addresses See Advertisements—Index Page 112

They toil not, neither do they spin

Spare tires do no work.

And, unless they have a high zinc oxide content, they soon become incapable of work. After months of idleness, they do not spin for anything like their allotted mileage.

But a tire made with plenty of zinc oxide can start spinning late in life with all the vigor and resiliency of early youth.

The importance of this characteristic becomes evident when the percentage of tires carried as spares is considered.

THE NEW JERSEY ZINC COMPANY
160 Front Street (Established 1848) New York City

CHICAGO: Mineral Point Zinc Company
PITTSBURGH: The New Jersey Zinc Sales Co.
SAN FRANCISCO: The New Jersey Zinc Sales Co.
CLEVELAND: The New Jersey Zinc Sales Co.

The world's standard for zinc products

New Jersey zinc

RUBBER BUYERS' DIRECTORY—Continued.

Nipples—Continued.

Seamless Rubber Co., Inc., New Haven, Conn.
Tyer Rubber Co., Andover, Mass.
United States Rubber Co., New York.
Whitall Tatum Co., N. Y.

Shower Bath Sprinklers.

Brass Goods Mfg. Co., Brooklyn, N. Y.
Davol Rubber Co., Providence.
Hodgman Rubber Co., New York.
Schrader's, A., Son, Inc., New York.
Seamless Rubber Co., Inc., New Haven Conn.
Siola Rubber Mfg. Co., Inc., The, New York.
United States Rubber Co., New York.

Sponges.

Faultless Rubber Co., Ashland, Ohio.
United States Rubber Co., New York.

Stationers' Sundries.

American Hard Rubber Co., New York.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Cincinnati Rubber Mfg. Co., Cincinnati, Ohio.
Connecticut Hard Rubber Co., The, West Haven, Conn.
Davol Rubber Co., Providence, R. I.
Hodgman Rubber Co., New York.
Seamless Rubber Co., Inc., New Haven, Conn.
Siola Rubber Mfg. Co., Inc., The, New York.
Tyer Rubber Co., Andover, Mass.
United States Rubber Co., New York.

Stopples (Metal).

Brass Goods Mfg. Co., Brooklyn, N. Y.
Schrader's, A., Son, Inc., New York.

Stopples (Rubber).

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Canfield Rubber Co., Bridgeport, Conn.
Faultless Rubber Co., Ashland, Ohio.
Hodgman Rubber Co., New York.
New York Belting & Packing Co., N. Y.
Seamless Rubber Co., Inc., New Haven, Conn.
Siola Rubber Mfg. Co., Inc., The, New York.
United States Rubber Co., New York.

Thread.

Easthampton Rubber Thread Co., Easthampton, Mass.
Mechanical Fabric Co., Providence, R. I.
United States Rubber Co., New York.

Tobacco Pouches.

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Rubber Products Co., The, Barberton, O.
Siola Rubber Mfg. Co., Inc., The, New York.
Tyer Rubber Co., Andover, Mass.
United States Rubber Co., New York.

MACKINTOSHED AND SURFACE GOODS.

Airplane and Balloon Cloths.

North British Rubber Co., Ltd., Edinburgh, Scotland.
United States Rubber Co., New York.

Air Mattresses.

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Davol Rubber Co., Providence, R. I.
Hodgman Rubber Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Siola Rubber Mfg. Co., Inc., The, New York.
United States Rubber Co., New York.

Aprons—Rubber.

Archer Rubber Co., Milford, Mass.
Davol Rubber Co., Providence, R. I.

Aprons—Rubber—Continued.

Faultless Rubber Co., Ashland, Ohio.
Hodgman Rubber Co., New York.
Kleinert, I. B., Rubber Co., The, New York.
Schwarzwaelder Co., The, Philadelphia, Pa.
Seamless Rubber Co., New Haven, Conn.
Siola Rubber Mfg., Co., Inc., The, N. Y.
United States Rubber Co., New York.

Bellows Cloths.

Archer Rubber Co., Milford, Mass.
Boston Belting Co., Boston, Mass.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Clifton Manufacturing Co., Boston, Mass.
Hodgman Rubber Co., New York.
Plymouth Rubber Co., Inc., Canton, Mass.
United States Rubber Co., New York.

Bibs.

Canfield Rubber Co., Bridgeport, Conn.
Davol Rubber Co., Providence, R. I.
Kleinert, I. B., Rubber Co., The, New York.
Seamless Rubber Co., Inc., New Haven, Conn.
Siola Rubber Mfg. Co., Inc., The, New York.
Tyer Rubber Co., Andover, Mass.
United States Rubber Co., New York.

Blankets—Camp and Hospital.

Archer Rubber Co., Milford, Mass.
Boston Belting Co., Boston, Mass.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Clifton Manufacturing Co., Boston, Mass.
Hodgman Rubber Co., New York.
United States Rubber Co., New York.

Calendering.

Archer Rubber Co., Milford, Mass.
Canfield Rubber Co., Bridgeport, Conn.
Hodgman Rubber Co., New York.
Plymouth Rubber Co., Inc., Canton, Mass.
United States Rubber Co., New York.

Carriage Ducks and Drills.

Boston Woven Hose & Rubber Co., Cambridge, Mass.
Canadian Consolidated Rubber Co., Ltd Montreal, Canada.
Clifton Manufacturing Co., Boston, Mass
Hodgman Rubber Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Plymouth Rubber Co., Inc., Canton, Mass
United States Rubber Co., New York.

Clothing and Mackintoshes.

Archer Rubber Co., Milford, Mass.
Badger Raincoat Co., Port Washington Wis.
Canadian Consolidated Rubber Co., Ltd Montreal, Canada.
Firestone-Apsley Rubber Co., Hudson Mass.
Hodgman Rubber Co., New York.
Miner Rubber Co., Ltd., The, Granby Quebec.
North British Rubber Co., Edinburgh Scotland.
Pirelli, Milan, Italy.
United States Rubber Co., New York

Dress Shield Material.

Archer Rubber Co., Milford, Mass.
Hodgman Rubber Co., New York.
Kleinert, I. B., Rubber Co., The, New York.
Plymouth Rubber Co., Inc., Canton, Mass
Schwarzwaelder Co., The, Philadelphia Pa.
Siola Rubber Mfg. Co., Inc., The, New York.
United States Rubber Co., New York.

Diving Apparatus.

Hale, Alfred, Rubber Co., Boston, Mass
Hodgman Rubber Co., New York.
Schrader's, A., Son, Inc., Brooklyn.
United States Rubber Co., New York.

Horse Covers.

Canadian Consolidated Rubber Co., Ltd Montreal, Canada.
North British Rubber Co., Ltd., Edinburgh, Scotland.

Horse Cover Material.

United States Rubber Co., New York.

Leggings.

Hodgman Rubber Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.

Leather, Artificial.

Boston Woven Hose & Rubber Co., Cambridge, Mass.

Piano Player Cloths.

Hodgman Rubber Co., New York.
United States Rubber Co., New York.

Ponchos.

Archer Rubber Co., Milford, Mass.
Clifton Manufacturing Co., Boston, Mass.
Hodgman Rubber Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Schwarzwaelder Co., The, Philadelphia, Pa.
United States Rubber Co., New York.

Printing on Rubber Surface.

Archer Rubber Co., Milford, Mass.
Plymouth Rubber Co., Inc., Canton, Mass.

Proofing.

Archer Rubber Co., Milford, Mass.
Archer-Strauss Rubber Co., Framingham, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Canfield Rubber Co., Bridgeport, Conn.
Hale, Alfred, Rubber Co., Atlantic, Mass.
Hodgman Rubber Co., New York.
Miner Rubber Co., Ltd., The, Granby, Quebec.
Plymouth Rubber Co., Inc., Canton, Mass.
Schwarzwaelder Co., The, Philadelphia, Pa.
Siola Rubber Mfg. Co, Inc., The, New York.
Toledo Auto Fabrics Co., The, Toledo, Ohio.
United States Rubber Co., New York.

Rubber Coated Cloths.

Archer Rubber Co., Milford, Mass.
Archer-Strauss Rubber Co., Framingham, Mass.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Clifton Manufacturing Co., Boston, Mass.
Hale, Alfred, Rubber Co., Atlantic, Mass.
Hodgman Rubber Co., New York.
Mechanical Fabric Co., Providence, R. I.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Plymouth Rubber Co., Inc., Canton, Mass.
Schwarzwaelder Co., The, Philadelphia, Pa.
Toledo Auto Fabrics Co., The, Toledo, Ohio.
United States Rubber Co., New York.

RUBBER FOOTWEAR.

Boots and Shoes.

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Firestone-Apsley Rubber Co., Hudson, Mass.
Gutta Percha & Rubber, Limited, Toronto, Canada.
Miner Rubber Co., Granby, Quebec.
North British Rubber Co., Ltd., Edinburgh, Scotland.
United States Rubber Co., New York.

Heels.

Meade Rubber Co., Stoughton, Mass.
Miner Rubber Co., Ltd., The, Granby, Quebec.
Plymouth Rubber Co., Inc., Canton, Mass.

Heels and Soles.

Boston Woven Hose & Rubber Co., Cambridge, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Canfield Rubber Co., Bridgeport, Conn.
Essex Rubber Co., Trenton, N. J.
Gutta Percha and Rubber, Limited, Toronto, Canada.
Hale, Alfred, Rubber Co., Atlantic, Mass.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Siola Rubber Mfg. Co., Inc., The, New York.
United States Rubber Co., New York.
Western Rubber Co., Goshen, Ind.

Heel Burrs.

Sessions, J. H., & Son, Bristol, Conn.
Ward & Andre, Brockton, Mass.

Heel Nails.

Eastern Nail Co., Inc., Providence, R. I.
United Shoe Machinery Corporation, Boston, Mass.

Shoe Findings and Specialties.

Clifton Manufacturing Co., Boston, Mass.
Essex Rubber Co., Trenton, N. J.
Meade Rubber Co., Stoughton, Mass.
Siola Rubber Mfg. Co., Inc., The, New York.
United States Knitting Co., Pawtucket, Mass.
United States Rubber Co., New York.

Soling.

Boston Belting Co., Boston, Mass.
Gutta Percha & Rubber, Ltd., Toronto, Can.
Siola Rubber Mfg. Co., Inc., The, New York.

Wading Pants.

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Hale, Alfred, Rubber Co., Boston, Mass.
Hodgman Rubber Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
United States Rubber Co., New York.

DENTAL AND STAMP RUBBER.

Dental Gum.

North British Rubber Co., Ltd., Edinburgh, Scotland.
Siola Rubber Mfg. Co., Inc., The, New York.
United States Rubber Co., New York.
White, S. S., Dental Mfg. Co., The, Philadelphia, Pa.

Dentists' Sundries.

Siola Rubber Mfg. Co., Inc., The, New York.
United States Rubber Co., New York.

Rubber Dam.

Davol Rubber Co., Providence, R. I.
Hodgman Rubber Co., New York.
Plymouth Rubber Co., Inc., Canton, Mass.
Siola Rubber Mfg. Co., Inc., The, New York.
United States Rubber Co., New York.

Sponge Rubber.

Faultless Rubber Co., Ashland, Ohio.
United States Rubber Co., New York.

Stamp Gum.

Gutta Percha & Rubber, Ltd., Toronto.
Siola Rubber Mfg. Co., Inc., The, New York.
United States Rubber Co., New York.

ELECTRICAL.

Electrical Supplies.

American Hard Rubber Co., New York.
Canfield Rubber Co., Bridgeport, Conn.
Connecticut Hard Rubber Co., The, West Haven, Conn.
Siola Rubber Mfg. Co., Inc., The, New York.
Stokes, Joseph, Rubber Co., Trenton, N. J.
Tyer Rubber Co., Andover, Mass.

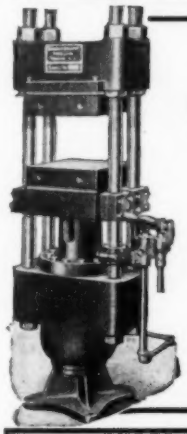
For Complete Addresses See Advertisements—Index Page 112

MOLDS *for* RUBBER HEELS

With Our Modern Machinery Equipment and Labor Saving Devices, We Can Quote the Heel Manufacturer Attractive Prices.

Immediate Shipment.

LEVI C. WADE
650 SUMMER ST. LYNN, MASS.



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and other Plastics. SEMI-AUTOMATIC or plain. Any size, any pressure. Also Accumulators, Pumps, Valves, Etc. Let us tell you more about them.

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COVE BASE MOLDS

Specialists in Molds for Tiling and All Types of Rubber Flooring

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Experimental and General Machine Work.

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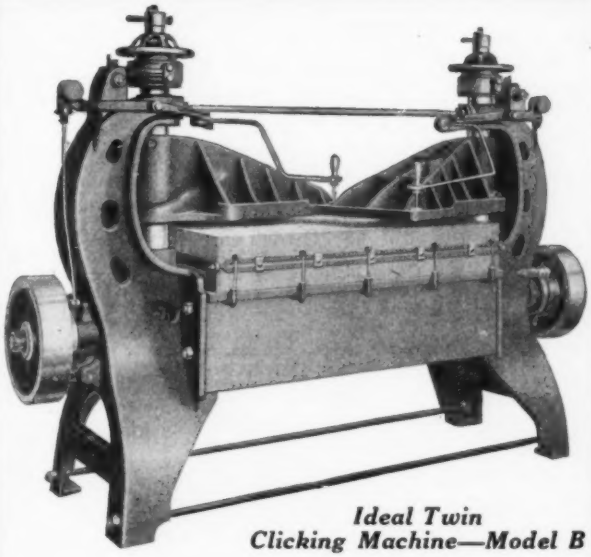
THE SARGENT TRADING CO. Cleveland, Ohio



Ideal Twin Clicking Machine—Model B

GREATER FABRIC CUTTING EFFICIENCY

Foremost among cutting machines in the rubber shoe factories is the Ideal Twin Clicking Machine—Model B.

This machine is productive of the greatest accuracy in cutting and is extremely economical.

Its design and equipment allow for the accomodation of practically all widths of stock and permit the easiest method of feeding. The operator can see his work at all times which enables him to place the dies accurately and thereby eliminate unnecessary waste.

USMC Clicking Dies and Helmet Brand or Long Life Clicking Blocks are worthy accessories to this highly efficient machine.

Every rubber shoe factory should be equipped with Ideal Twin Clicking Machine—Model B.

United Shoe Machinery Corporation — Boston

Branches

Auburn, Me.....87 Main
Brockton, Mass.....93 Centre
Cincinnati.....708 Broadway
Chicago.....18 South Market
Haverhill, Mass.....145 Essex
Johnson City, N. Y., 276 Main
Lynn, Mass.....396 Broad
Marlboro, Mass ..11 Florence
Milwaukee.....258 Fourth
New Orleans.....216 Chartres
New York.....37 Warren
Philadelphia....221 North 13th
Rochester, N. Y.....130 Mill
St. Louis.....1423 Olive
San Francisco.....859 Mission

RUBBER BUYERS' DIRECTORY—Continued.

Electrical Supplies—Continued.

United States Rubber Co., New York.
Vulcanized Rubber Co., New York.

Hard Rubber Goods.

American Hard Rubber Co., New York.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Canfield Rubber Co., Bridgeport, Conn.
Connecticut Hard Rubber Co., The, West Haven, Conn.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Stokes, Joseph, Rubber Co., Trenton, N. J.
United States Rubber Co., New York.
Vulcanized Rubber Co., New York.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Insulating Compounds.

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Canfield Rubber Co., Bridgeport, Conn.
Gutta Percha and Rubber, Limited, Toronto, Canada.
Robertson, H. H., Co., Pittsburgh, Pa.
Siola Rubber Mfg. Co., Inc., The, New York.
Tidewater Chemical Co., Inc., New York.
Tyson Bros., Inc., Woodbridge, N. J.

Insulated Wire and Cables.

Kerite Ins. Wire & Cable Co., N. Y.
Pirelli, Milan, Italy.
United States Rubber Co., New York.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Splicing Compounds.

Boston Woven Hose & Rubber Co., Cambridge, Mass.
Canfield Rubber Co., Bridgeport, Conn.
Clifton Manufacturing Co., Boston, Mass.
Home Rubber Co., Trenton, N. J.
Plymouth Rubber Co., Inc., Canton, Mass.
Siola Rubber Mfg. Co., Inc., The, New York.
United States Rubber Co., New York.

Tape—Cloth Friction.

Boston Woven Hose & Rubber Co., Cambridge, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Canfield Rubber Co., Bridgeport, Conn.
Clifton Manufacturing Co., Boston, Mass.
Home Rubber Co., Trenton, N. J.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Plymouth Rubber Co., Inc., Canton, Mass.
Siola Rubber Mfg. Co., Inc., The, New York.
United States Rubber Co., New York.

Tape—Rubber Insulating.

Clifton Manufacturing Co., Boston, Mass.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Plymouth Rubber Co., Inc., Canton, Mass.
Siola Rubber Mfg. Co., Inc., The, New York.
United States Rubber Co., New York.

Wire—Rubber Insulated.

United States Rubber Co., New York.

Wire—Lead Covered.

United States Rubber Co., New York.

SPORTING GOODS.

Foot Balls.

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Hodgman Rubber Co., New York.
Seamless Rubber Co., Inc., The, New Haven, Conn.
Tyer Rubber Co., Andover, Mass.
United States Rubber Co., New York.

Golf Balls.

Faultless Rubber Co., Ashland, Ohio.
North British Rubber Co., Ltd., Edinburgh, Scotland.
United States Rubber Co., New York.

Sporting Goods.

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Essex Rubber Co., Trenton, N. J.
Hodgman Rubber Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Pennsylvania Rubber Co., Jeannette, Pa.
Seamless Rubber Co., Inc., New Haven, Conn.
Tyer Rubber Co., Andover, Mass.
United States Rubber Co., New York.

Striking Bags.

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Rubber Products Co., Barberton, O.
Seamless Rubber Co., Inc., New Haven, Conn.
Tyer Rubber Co., Andover, Mass.
United States Rubber Co., New York.

Tennis Balls.

Pennsylvania Rubber Co., Jeannette, Pa.

RUBBER TIRES AND ACCESSORIES.

Accessories.

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Essex Rubber Co., Trenton, N. J.
Firestone Tire & Rubber Co., Akron, Ohio.
Fisk Rubber Co., Chicopee Falls, Mass.
General Tire & Rubber Co., Akron, Ohio.
Gutta Percha & Rubber, Ltd., Toronto, Canada.
Siola Rubber Mfg. Co., Inc., The, New York.
United States Rubber Co., New York.
Voorhees Rubber Mfg. Co., Jersey City, N. J.

Auto Top Fabrics.

Boston Woven Hose & Rubber Co., Cambridge, Mass.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Hodgman Rubber Co., New York.
Lawrence & Co., New York.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Plymouth Rubber Co., Inc., Canton, Mass.
Siola Rubber Mfg. Co., Inc., The, N. Y.
Taylor, Armitage & Eagles, Inc., N. Y.
Toledo Auto Fabrics Co., The, Toledo, Ohio.
United States Rubber Co., New York.

Bead Braid (Wire).

American Chain Co., Inc., Bridgeport, Conn.
National-Standard Co., Niles, Mich.

Inner Tubes.

Acme Rubber Mfg. Co., Trenton, N. J.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Essex Rubber Co., Trenton, N. J.
Firestone Tire & Rubber Co., Akron, Ohio.
Fisk Rubber Co., The, Chicopee Falls, Mass.
General Tire & Rubber Co., Akron, Ohio.
Gutta Percha & Rubber, Ltd., Toronto.
Hewitt Rubber Co., Buffalo, N. Y.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Pennsylvania Rubber Co., Jeannette, Pa.
Quaker City Rubber Co., Philadelphia, Pa.
Rubber Products Co., Barberton, O.
Tyer Rubber Co., Andover, Mass.
United States Rubber Co., New York.
Voorhees Rubber Mfg. Co., Jersey City, N. J.

Mats—Automobile.

(See Matting and Mechanical Rubber Goods.)

Repair Stock.

Buckeye Rubber Mfg. Co., The, Willoughby, Ohio.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Essex Rubber Co., Trenton, N. J.
Fisk Rubber Co., New York.
General Tire & Rubber Co., Akron, Ohio.
Miller, Chas. E., Anderson, Ind.
Siola Rubber Mfg. Co., Inc., The, New York.
United States Rubber Co., New York.

Tires (Airplanes).

North British Rubber Co., Ltd., Edinburgh, Scotland.

Tires (Auto).

Acme Rubber Mfg. Co., Trenton, N. J.
Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Firestone Tire & Rubber Co., Akron, Ohio.
Fisk Rubber Co., Chicopee Falls, Mass.
General Tire & Rubber Co., Akron, Ohio.
Gutta Percha & Rubber, Ltd., Toronto.
Hewitt Rubber Co., Buffalo, N. Y.
Miller, Chas. E., Anderson, Ind.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Pennsylvania Rubber Co., Jeannette, Pa.
Pirelli, Milan, Italy.
Quaker City Rubber Co., Philadelphia, Pa.
Rubber Products Co., Barberton, O.
Thermoid Rubber Co., Trenton, N. J.
Tyer Rubber Co., Andover, Mass.
United States Rubber Co., New York.

Tires—Baby Carriage.

Boston Woven Hose & Rubber Co., Cambridge, Mass.
Cincinnati Rubber Mfg. Co., Cincinnati, Ohio.
Firestone Tire & Rubber Co., Akron, Ohio.
Gutta Percha & Rubber, Ltd., Toronto, Canada.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Quaker City Rubber Co., Philadelphia, Pa.
United States Rubber Co., New York.

Tires (Bicycle).

Firestone Tire & Rubber Co., Akron, Ohio.
Fisk Rubber Co., Chicopee Falls, Mass.
Miller, Chas. E., Anderson, Ind.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Pennsylvania Rubber Co., Jeannette, Pa.

Tires (Motorcycle).

Canadian Consolidated Rubber Co., Ltd., Montreal, Canada.
Firestone Tire & Rubber Co., Akron, Ohio.
Fisk Rubber Co., Chicopee Falls, Mass.
Miller, Chas. E., Anderson, Ind.
North British Rubber Co., Ltd., Edinburgh, Scotland.
Pennsylvania Rubber Co., Jeannette, Pa.

Tires (Solid).

Buckeye Rubber Mfg. Co., The, Willoughby, Ohio.
Canadian Consolidated Rubber Co., Ltd., Montreal, Can.
Firestone Tire & Rubber Co., Akron, Ohio.
Fisk Rubber Co., Chicopee Falls, Mass.
Gutta Percha & Rubber, Ltd., Toronto, Canada.
North British Rubber Co., Ltd., Edinburgh, Scotland.
United States Rubber Co., New York.

Tire Fabrics (See Cotton Goods in Raw Materials and Supplies).

Tire Repair Materials.

Buckeye Rubber Mfg. Co., The, Willoughby, Ohio.
Essex Rubber Co., Trenton, N. J.
Fisk Rubber Co., Chicopee Falls, Mass.
Miller, Chas. E., Anderson, Ind.
Siola Rubber Mfg. Co., Inc., The, New York.
Voorhees Rubber Mfg. Co., Jersey City, N. J.

Valves, Tire.

Schrader's, A., Sons, Inc., New York.

Wire Bead Braids (Flat).

American Chain Co., Inc., Bridgeport, Conn.
National-Standard Co., Niles, Mich.

RUBBER MACHINERY.

Accumulators—Hydraulic.

Adamson Machine Co., The, Akron, O.
Akron Equipment Co., The, Akron, O.
Allen Machine Co., Erie, Pa.
Birmingham Iron Foundry, Derby, Conn.
Burroughs Co., The, Newark, N. J.
Dunning & Boschert Press Co., Inc., The, Syracuse, N. Y.
Farrel F. & M. Co., Ansonia, Conn.
Southwark Foundry & Machine Co., Philadelphia, Pa.
Thropp's John E., Sons Co., Trenton, N. J.
Watson-Stillman Co., The, New York.
Williams F. & M. Co., Akron, Ohio.

Acid Tanks.

Buffalo Foundry & Machine Co., Buffalo, N. Y.
Devine, J. P., Co., Buffalo, N. Y.
Farrel F. & M. Co., Ansonia, Conn.

Air Bags

Miller, Charles E., Anderson, Ind.

Air Compressors.

Miller, Chas. E., Anderson, Ind.
Williams F. & M. Co., Akron, Ohio.

Band Cutting Machines.

Adamson Machine Co., The, Akron, O.
Birmingham Iron Foundry, Derby, Conn.

Barometers, Hydrometers and Pyrometers.

American Schaeffer & Budenberg Corp., Brooklyn, N. Y.
Schaeffer & Budenberg Mfg. Co., The, Brooklyn, N. Y.

For Complete Addresses See Advertisements—Index Page 112

Core and Mold Equipment

MECHANICAL MOLDS SPECIAL MACHINES
GEARS AND GEAR CUTTING

The Akron Gear & Engineering Company
Cor. South & High Sts. AKRON, OHIO

Columbia Whiting
Uniform, high-grade quality specially adapted for rubber manufacturers. Write for sample and prices
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MILL DRIVES SPEED REDUCERS
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SPUR WORM BEVEL GEARS
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TIRE MOLD EQUIPMENT
SERVICE—QUALITY—PRICE
REMACO MOLDS CORES
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STUART Operating TWO PRESSURE Valves

Designed for use with any press supplied with both high and low hydraulic pressures, such as rubber presses, tire heaters, Bakelite presses, pipe testers, etc.
Will increase your production—effect savings in high pressure water and labor.
Write for details.

PITTSBURGH VALVE FOUNDRY & CONSTRUCTION CO.
PITTSBURGH, PA.

WOVEN STEEL HOSE & RUBBER COMPANY

Manufacturers of **Long Length Moulded Hose**

On Reels of Approximately 500 Feet For Air and Water

ARMORED OR PLAIN LOCOMOTIVE SQUIRT HOSE COMPLETE WITH FITTINGS

Mechanical Rubber Goods **Automobile Brake Lining**

TRENTON, N. J., U. S. A.

RUBBER BUYERS' DIRECTORY—Continued.

Bead Presses.

Allen Machine Co., Erie, Pa.
Farrel Foundry & Machine Co., Ansonia, Conn.
Southwark Foundry & Machine Co., Philadelphia, Pa.
Williams Foundry & Machine Co., The, Akron, Ohio.

Bead Trimmers.

Banner Machine Co., The, Columbiana, Ohio.

Belt Folding Machines.

Birmingham Iron Foundry, Derby, Conn.
Farrel F. & M. Co., Ansonia, Conn.

Belt Slitters.

Birmingham Iron Foundry, Derby, Conn.
Farrel F. & M. Co., Ansonia, Conn.

Belt Stretchers.

Birmingham Iron Foundry, Derby, Conn.
Farrel F. & M. Co., Ansonia, Conn.
Hoggson & Pettis Mfg. Co., New Haven, Conn.
Southwark Foundry & Machine Co., Philadelphia, Pa.

Bias Cutters.

Birmingham Iron Foundry, Derby, Conn.
Spadone Machine Co., Inc., New York.

Blanking Rolls.

Burroughs Co., The, Newark, N. J.

Boilers.

Thropp's, John E., Sons Co., Trenton, N. J.
Thropp, William R., Sons' Co., Trenton, N. J.

Braiders, Hose.

New England Butt Co., Providence, R. I.

Brushing Machines and Brushes.

Curtis & Marble Mach. Co., Worcester, Mass.

Buffing Machines.

Banner Machine Co., The, Columbiana, Ohio.
Williams Foundry & Machine Co., The, Akron, Ohio.

Burrs—Light Steel for Rubber Heels.

Sessions, J. H., & Son, Bristol, Conn.
Ward & Andre, Brockton, Mass.

Calenders.

Adamson Machine Co., The, Akron, Ohio.
Allen Machine Co., Erie, Pa.
Birmingham Iron Foundry, Derby, Conn.
Black Rock Mfg. Co., Bridgeport, Conn.
Farrel F. & M. Co., Ansonia, Conn.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

Calenders—Brake Lining.

Allen Machine Co., Erie, Pa.
Black Rock Mfg. Co., The, Bridgeport, Conn.

Calender Screw-Down — Motor Driven.

Allen Machine Co., Erie, Pa.
Birmingham Iron Foundry, Derby, Conn.
Farrel Foundry & Machine Co., Ansonia, Conn.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

Castings.

Adamson Machine Co., The, Akron, O.
Allen Machine Co., Erie, Pa.
Banner Machine Co., The, Columbiana, Ohio.
Birmingham Iron Foundry, Derby, Conn.

Castings—Continued.

Buffalo Foundry & Machine Co., Buffalo, N. Y.
De Mattia Bros., Garfield, N. J.
Farrel F. & M. Co., Ansonia, Conn.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.
Williams F. & M. Co., Akron, Ohio.

Cell Dryers

Butterworth, H. W., & Sons Co., Philadelphia, Pa.

Chains—Welded and Weldless.

American Chain Co., Inc., Bridgeport, Conn.

Chemical Apparatus.

Devine, J. P., Co., Buffalo, N. Y.

Chemical Plants.

Buffalo Foundry & Machine Co., Buffalo, N. Y.
Devine, J. P., Co., Buffalo, N. Y.

Chucks—Lathe and Drill.

Hoggson & Pettis Mfg. Co., New Haven, Conn.

Churns and Cement Making Machines.

Day Co., J. H., Cincinnati, Ohio.
East Iron & Machine Co., Lima, Ohio.
Miller, Chas. E., Anderson, Ind.

Cloth Dryers.

Allen Machine Co., Erie, Pa.
Banner Machine Co., The, Columbiana, Ohio.
Birmingham Iron Fdry., Derby, Conn.
Butterworth, H. W., & Sons Co., Philadelphia, Pa.
Farrel F. & M. Co., Ansonia, Conn.
Textile-Finishing Machinery Co., Providence, R. I.

Clutch Brakes—Pneumatic.

Birmingham Iron Foundry, Derby, Conn.

Clutches—Friction.

Allen Machine Co., Erie, Pa.
Birmingham Iron Fdry., Derby, Conn.
Farrel F. & M. Co., Ansonia, Conn.
Johnson, Carlyle, Machine Co., The, Manchester, Conn.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.
Williams F. & M. Co., Akron, Ohio.

Condensers.

Buffalo Fdy. & Mach. Co., Buffalo, N. Y.

Controllers—Electrical.

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Counters.

American Schaeffer & Budenberg Corp., Brooklyn, N. Y.
Schaeffer & Budenberg Mfg. Co., The Brooklyn, N. Y.

Couplings.

Allen Machine Co., Erie, Pa.
Allis-Chalmers Mfg. Co., Milwaukee, Wis
Birmingham Iron Foundry, Derby, Conn
Dixon Valve & Coupling Co., Philadelphia, Pa.

Couplings—Flexible and Rigid

Allis-Chalmers Mfg. Co., Milwaukee, Wis
Birmingham Iron Foundry, Derby, Conn
Farrel Foundry & Machine Co., Ansonia, Conn.
Smith & Serrell, Newark, N. J.

Crackers.

Adamson Machine Co., The, Akron, Ohio
Allen Machine Co., Erie, Pa.
Birmingham Iron Foundry, Derby, Conn
Farrel F. & M. Co., Ansonia, Conn.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

Cranes.

Allis-Chalmers Mfg. Co., Milwaukee, Wis
Southwark Foundry & Machine Co., Philadelphia, Pa.

Cranes—Hydraulic.

Watson-Stillman Co., The, New York.

Cutters—Crude Rubber.

Peerless Machine Co., Racine, Wis.

Cutters—Scrap.

Taylor, Stiles & Co., Riegelsville, N. J.

Cutters—Tire Section.

Adamson Machine Co., The, Akron, Ohio.
Banner Machine Co., Columbiana, Ohio.

Devulcanizers.

Biggs Boiler Works Co., The, Akron, O.

Die Sinking and Engraving.

Burroughs Co., The, Newark, N. J.

Die Blocks.

Hoggson & Pettis Mfg. Co., The, New Haven, Conn.

Dies.

Akron Equipment Co., The, Akron, O.
Akron Machine, Mold, Tool & Die Co., Akron, Ohio.
Hoggson & Pettis Mfg. Co., New Haven, Conn.
Housatonic Mach. & Tool Co., Bridgeport, Conn.
Mechanical Mold & Machine Co., The, Akron, Ohio.
Terkelsen Machine Co., Boston, Mass.
Ward & Andre, Brockton, Mass.
Williams F. & M. Co., Akron, Ohio.

Dipped Goods Forms (Porcelain).

Colonial Insulator Co., The, Akron, Ohio.
Seville Porcelain Co., Seville, Ohio.

Doubling Machines.

Birmingham Iron Fdry., Derby, Conn.
Farrel F. & M. Co., Ansonia, Conn.

Draft Gages.

American Schaeffer & Budenberg Corp., Brooklyn, N. Y.
Schaeffer & Budenberg Mfg. Co., The, Brooklyn, N. Y.

Drives—Mill

Allen Machine Co., Erie, Pa.
Birmingham Iron Foundry, Derby, Conn.
Farrel Foundry & Machine Co., Ansonia, Conn.
Fawcus Machine Co., Pittsburgh, Pa.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

Dryers—Vacuum.

Buffalo Fdy. & Mach. Co., Buffalo, N. Y.
Devine, J. P., Co., Buffalo, N. Y.

Drying and Processing.

Carrier Engineering Corp, Newark N. J
Hunter Dry Kiln Co., Indianapolis, Ind.

Drying Machines.

Allen Machine Co., Erie, Pa.
American Process Co., New York.
Birmingham Iron Foundry, Derby, Conn.
Buffalo Foundry & Machine Co., Buffalo, N. Y.
Carrier Engineering Corp, Newark N. J.
Devine, J. P., Co., Buffalo, N. Y.
Farrel F. & M. Co., Ansonia, Conn.
Hunter Dry Kiln Co., Indianapolis, Ind.
Textile-Finishing Machinery Co., Providence, R. I.

Duck Slitters.

Birmingham Iron Foundry, Derby, Conn.

Durometers.

Shore Instrument & Mfg. Co., The, Jamaica, N. Y.

Electrical Safety Switches.

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Embossing Calenders.

Allen Machine Co., Erie, Pa.
Birmingham Iron Fdry., Derby, Conn.
Farrel F. & M. Co., Ansonia, Conn.
Textile-Finishing Machinery Co., Providence, R. I.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

Engineering Devices.

Yarnall-Waring Co., Philadelphia, Pa.

Engines—Steam.

Thropp's, John E., Sons Co., Trenton, N. J.
Thropp, William R., Sons' Co., Trenton, N. J.

Engraving Rolls.

Birmingham Iron Fdry., Derby, Conn.
Farrel F. & M. Co., Ansonia, Conn.
Hoggson & Pettis Mfg. Co., New Haven, Conn.

Engraving—Tire Molds.

Akron Equipment Co., The, Akron, O.
Allen Machine Co., Erie, Pa.
Banner Machine Co., The, Columbiana, Ohio.
De Mattia Bros., Garfield, N. J.
Williams Foundry & Machine Co., The, Akron, Ohio.

Evaporators.

Buffalo Foundry & Machine Co., Buffalo, New York.
Devine, J. P., Co., Buffalo, N. Y.

Eyeletting Machines.

United Shoe Machinery Corporation, Boston, Mass.

Fittings.

Utility Manufacturing Co., Cudahy, Wis.

Fittings—Hydraulic Pipe.

Smith & Serrell, Newark, N. J.
Watson-Stillman Co., The, New York.

Gages.

American Schaeffer & Budenberg Corp., Brooklyn, N. Y.
Bristol Co., The, Waterbury, Conn.
Hoggson & Pettis Mfg. Co., New Haven Conn.
Schaeffer & Budenberg Co., The, Brooklyn, N. Y.

Gages—Thickness.

Hoggson & Pettis Mfg. Co., New Haven Conn.
Perkins, B. F., & Son, Inc., Holyoke, Mass.
Randall, Frank E., Waltham, Mass.

Gear Cutting.

Akron Gear & Engineering Co., The, Akron, Ohio.
Birmingham Iron Foundry, Derby, Conn.
Farrel Foundry & Machine Co., Ansonia, Conn.
Fawcus Machine Co., Pittsburgh, Pa.

Gears.

Spring.
Silent Chain.
Compensating.

Akron Gear & Engineering Co., Akron, Ohio.
Allen Machine Co., Erie, Pa.
Farrel Foundry & Machine Co., Ansonia, Conn.
Fawcus Machine Co., Pittsburgh, Pa.

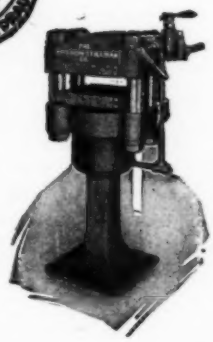
Gears—Helical.

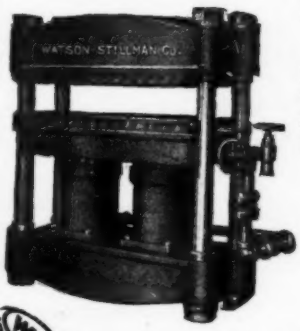
Farrel Foundry & Machine Co., Ansonia, Conn.

Gears-Herringbone.

Birmingham Iron Foundry, Derby, Conn.
Falk Corp., The, Milwaukee, Wis.
Farrel Foundry & Machine Co., Ansonia, Conn.

For Complete Addresses See Advertisements—Index Page 112





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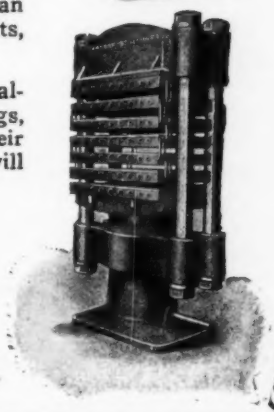
FOR HOT MOULDING RADIO PARTS, TELEPHONE RECEIVERS, INSULATING PARTS, RADIATOR CAPS, AUTO PARTS, PHONOGRAPH RECORDS, ETC.

We show here just a few examples from our large line. They are made in standard sizes from 10 to 1,800 tons capacity and the number of plates and size of openings can be made to suit conditions. The top platens can also be made adjustable to accommodate various heights, of dies, etc.

We are prepared to furnish complete hydraulic installations, including pumps, accumulators, valves, fittings, etc. Watson-Stillman presses are characterized by their strength and simplicity. Their rugged construction will stand up under most severe conditions.

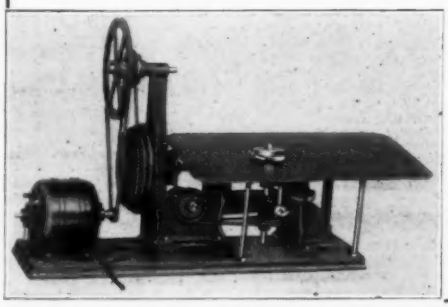
Write for catalogs.



THE WATSON-STILLMAN COMPANY
Engineers and Builders of Hydraulic Machinery
32 DEY STREET, NEW YORK CITY
CHICAGO, McCormick Bldg. PHILADELPHIA, Widener Bldg.

381

THE MORRIS INSIDE TRIMMER



For removing the inside overflow, from molded

FAN BELTS
PACKINGS
GASKETS
RINGS
DISCS
ETC.

T. W. MORRIS
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Chicago, Ill.

MARTIN H. BEHNCKE R. H. FREITAG

The Akron Machine, Mold, Tool & Die Co.

Mechanical Molds, Tools, Dies, Jigs, Fixtures, Templets, Cherrying Vices, Tire Molds, Cores, and general machine work.

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DRYING ROOM HUMIDITY AND TEMPERATURE

Correct humidity conditions constantly maintained are important in drying rubber and cotton fabric in drying rooms, dry kilns and vacuum driers.

TRADE MARK
BRISTOL'S
REG. U. S. PAT. OFFICE

RECORDING PSYCHROMETERS

furnish a reliable means of ascertaining relative humidity conditions. The equipment consists of two complete recording thermometer movements. The two bulbs are known as the wet and the dry bulb. Both elements are mounted together in one case and the two records are made on one chart. The difference in temperature between the wet and the dry bulb determines the relative humidity. This is very easily computed by use of the table which is furnished with the instrument.

Control the Quality by Controlling Conditions

Get a copy of Bulletin W-303

The Bristol Company
Waterbury, Conn.

RUBBER BUYERS' DIRECTORY—Continued.

Gears—Reduction.

Allen Machine Co., Erie, Pa.
Birmingham Iron Foundry, Derby, Conn.
Cleveland Worm & Gear Co. The Cleveland, Ohio.
Farrel Foundry & Machine Co., Ansonia, Conn.
Fawcus Machine Co., Pittsburgh, Pa.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

Gears—Worm

Cleveland Worm & Gear Co., The, Cleveland, Ohio.

Grinders—See Mixers.

Hangers.

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Birmingham Iron Fdry., Derby, Conn.
Fawcus Machine Co., Pittsburgh, Pa.
Farrel F. & M. Co., Ansonia, Conn.

Heater Presses.

Adamson Machine Co., The, Akron, Ohio
Akron Equipment Co., The, Akron, O.
Allen Machine Co., Erie, Pa.
Birmingham Iron Foundry, Derby, Conn.
Southwark Foundry & Machine Co., Philadelphia, Pa.
Williams Foundry & Machine Co., The, Akron, Ohio.

Hoists.

Utility Mfg. Co., Cudahy, Wis.

Hoists—Hydraulic.

Watson-Stillman Co., The, New York.

Hose Machines.

Banner Machine Co., The, Columbiana, Ohio.
Birmingham Iron Foundry, Derby, Conn.
Farrel F. & M. Co., Ansonia, Conn.
New England Butt Co., Providence, R. I.

Hose Wiring Machines.

Adamson Machine Co., The, Akron, Ohio.

Hydraulic Valves.

Birmingham Iron Foundry, Derby, Conn.
Dunning & Boschert Press Co., Inc., The, Syracuse, N. Y.
Pittsburgh Valve Foundry & Construction Co., Pittsburgh, Pa.
Yarnall-Waring Co., Philadelphia, Pa.

Insulating Machinery

Adamson Machine Co., The, Akron, O.
Allen Machine Co., Erie, Pa.
Biggs Boiler Works Co., The, Akron, Ohio.
Farrel Foundry & Machine Co., Ansonia, Conn.
Housatonic Machine & Tool Co., Bridgeport, Conn.
New England Butt Co., Providence, R. I.
Royle, John, & Sons, Paterson, N. J.

Jar Ring and Washer Cutting Machines.

Black Rock Mfg. Co., Bridgeport, Conn.

Laboratory Apparatus.

Allen Machine Co., Erie, Pa.
American Schaeffer & Budenberg Corp., Brooklyn, N. Y.
Banner Machine Co., The, Columbiana, Ohio.
Bristol Co., The, Waterbury, Conn.
Schaeffer & Budenberg Co., The, Philadelphia, Pa.
Shore Instrument & Mfg. Co., The, Jamaica, N. Y.

Laboratory Machinery.

Allen Machine Co., Erie, Pa.
Banner Machine Co., The, Columbiana, Ohio.
Biggs Boiler Works Co., The, Akron, Ohio
Birmingham Iron Foundry, Derby, Conn.
Buffalo Foundry & Machine Co., Buffalo, N. Y.
Devine, J. P., Co., Buffalo, N. Y.
Farrel Foundry & Machine Co., Ansonia, Conn.
Shaw, Francis, & Co., Limited, Manchester, England.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

Lathes—Hard Rubber.

Adamson Machine Co., The, Akron, O.

Lathes—Jar Ring.

Adamson Machine Co., The, Akron, O.
Thropp's, John E., Sons Co., Trenton, N. J.
Thropp, William R., Sons' Co., Trenton, N. J.

Locomotive Cranes.

Utility Manufacturing Co., Cudahy, Wis.

Machinery, Transmission (Power).

Allen Machine Co., Erie, Pa.
Birmingham Iron Foundry, Derby, Conn.
Farrel Foundry & Machine Co., Ansonia, Conn.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

Machinists' Tools.

Hoggson & Pettis Mfg. Co., New Haven, Conn.

Magnetic Clutches and Brakes.

Allen Machine Co., Erie, Pa.
Birmingham Iron Foundry, Derby, Conn.
Farrel Foundry & Machine Co., Ansonia, Conn.

Mandrels—Circular.

Lowe, Clyde E., Co., Cleveland, Ohio.

Mandrels—Tube Splicing.

Williams Foundry & Machine Co., The, Akron, Ohio.

Mandrels—Sherardizing.

Biggs Boiler Works Co., The, Akron, O.
New Haven Sherardizing Co., New Haven, Conn.

Masticators.

Birmingham Iron Foundry, Derby, Conn.
East Iron & Machine Co., The, Lima, Ohio.
Farrel Foundry & Machine Co., Ansonia, Conn.

Measuring Rolls.

Curtis & Marble Mach. Co., Worcester, Mass.

Mixers.

Adamson Machine Co., The, Akron, Ohio
Allen Machine Co., Erie, Pa.
Biggs Boiler Works Co., The, Akron, Ohio.
Birmingham Iron Foundry, Derby, Conn
Day, J. H., Co., Cincinnati, Ohio.
East Iron & Machine Co., The, Lima, Ohio.
Farrel Foundry & Machine Co., Ansonia, Conn.
Miller, Chas. E., Anderson, Ind.
Thropp's, John E., Sons Co., Trenton, N. J.
Thropp, William R., Sons' Co., Trenton, N. J.
Vaughn Machinery Co., Cuyahoga Falls, Ohio.

Mixers—Automatic.

Birmingham Iron Foundry, Derby, Conn
Farrel Foundry & Machine Co., Ansonia, Conn.

Molds.

Adamson Machine Co., The, Akron, O.
Akron Equipment Co., The, Akron, Ohio
Akron Gear & Engineering Co., Akron, Ohio.
Akron Machine, Mold, Tool & Die Co., Akron, Ohio.
Akron Rubber Mold and Machine Co., Akron, Ohio.
Akron Standard Mold Co., Akron, Ohio.
Banner Machine Co., The, Columbiana, Ohio.
Birmingham Iron Foundry, Derby, Conn.
Brockton Machine Co., Brockton, Mass.
Brockton Tool Co., Brockton, Mass.
Burroughs Co., The, Newark, N. J.
De Mattia Bros., Garfield, N. J.

Molds—Continued.

Hoggson & Pettis Mfg. Co., New Haven, Conn.
Housatonic Mach. & Tool Co., Bridgeport, Conn.
Kuhlke Machine Co., Akron, Ohio.
Mahlow & Wyckoff, Trenton, N. J.
Mechanical Mold & Machine Co., The, Akron, Ohio.
Miller, Chas. E., Anderson, Ind.
Southwark Foundry & Machine Co., Philadelphia, Pa.
Terkelsen Machine Co., Boston, Mass.
Thropp's, John E., Sons Co., Trenton, N. J.
Ward & Andre, Brockton, Mass.
Williams Foundry & Machine Co., Akron, O.

Molds—Engraving.

Banner Machine Co., The, Columbiana, Ohio.
De Mattia Bros., Garfield, N. J.
Williams Foundry & Machine Co., The, Akron, Ohio.

Molds—Heels and Soles.

Akron Gear & Engineering Co., Akron, Ohio.
Akron Machine, Mold, Tool & Die Co., Akron, Ohio.
Brockton Machine Co., Brockton, Mass.
Brockton Tool Co., Brockton, Mass.
Hoggson & Pettis Mfg. Co., New Haven, Conn.
Mechanical Mold & Machine Co., Akron, Ohio.
Terkelsen Machine Co., Boston, Mass.
Wade, Levi C., Lynn, Mass.
Ward & Andre, Brockton, Mass.

Molds—Druggists' Sundries.

Akron Machine, Mold, Tool & Die Co., Akron, Ohio.
Brockton Machine Co., Brockton, Mass.
Hoggson & Pettis Mfg. Co., The, New Haven, Conn.
Mechanical Mold & Machine Co., Akron, Ohio.

Molds—Mechanical Rubber Goods.

Adamson Machine Co., Akron, Ohio.
Akron Gear & Engineering Co., The, Akron, Ohio.
Akron Machine, Mold, Tool & Die Co., Akron, Ohio.
Brockton Machine Co., Brockton, Mass.
Mechanical Mold & Machine Co., Akron, Ohio.
Terkelsen Machine Co., Boston, Mass.
Wade, Levi C., Lynn, Mass.

Molds and Cores—Tires.

Adamson Machine Co., The, Akron, O.
Akron Equipment Co., Akron, Ohio.
Akron Gear & Engineering Co., Akron, O.
Akron Machine, Mold, Tool & Die Co., Akron, Ohio.
Akron Rubber Mold & Machine Co., Akron, O.
Akron Standard Mold Co., Akron, Ohio.
Allen Machine Co., Erie, Pa.
Banner Machine Co., The, Columbiana, Ohio.
De Mattia Bros., Garfield, N. J.
Franz Foundry & Machine Co., Akron, Ohio.
Hoggson & Pettis Mfg. Co., The, New Haven, Conn.
Kuhlke Machine Co., Akron, Ohio.
Mahlow & Wyckoff, Trenton, N. J.
Miller, Charles E., Anderson, Ind.
Reynolds Machine Co., The, Massillon, Ohio.
Thropp's, John E., Sons Co., Trenton, N. J.
Williams Foundry & Machine Co., Akron, Ohio.

Motors.

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Pattern Makers.

Adamson Machine Co., The, Akron, O.
Allen Machine Co., Erie, Pa.
Buffalo Foundry & Machine Co., Buffalo, N. Y.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

Pillow Blocks.

Adamson Machine Co., The, Akron, Ohio.
Allen Machine Co., Erie, Pa.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Birmingham Iron Fdry., Derby, Conn.
Farrel F. & M. Co., Ansonia, Conn.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

Pipe Joints.

Flexo Supply Co., St. Louis, Mo.

Plantation Machinery.

Allen Machine Co., Erie, Pa.
Birmingham Iron Foundry, Derby, Conn.
Farrel Foundry & Machine Co., Ansonia, Conn.
Shaw, Francis, & Co., Ltd., Manchester, Eng.

Presses—Packing.

Black Rock Mfg. Co., The, Bridgeport, Conn.

Presses—Rimming.

Adamson Machine Co., The, Akron, Ohio.
Allen Machine Co., Erie, Pa.
Farrel Foundry & Machine Co., Ansonia, Conn.
Southwark Foundry & Machine Co., Philadelphia, Pa.

Presses—Vulcanizing.

Adamson Machine Co., The, Akron, Ohio.
Akron Equipment Co., The, Akron, O.
Akron Rubber Mold & Machine Co., Akron, Ohio.
Allen Machine Co., Erie, Pa.
Birmingham Iron Foundry, Derby, Conn.
Burroughs Co., The, Newark, N. J.
Dunning & Boschert Press Co., Inc., Syracuse, N. Y.
Farrel F. & M. Co., Ansonia, Conn.
Southwark Foundry & Machine Co., Philadelphia, Pa.
Thropp's, John E., Sons Co., Trenton, N. J.
Thropp, William R., Sons' Co., Trenton, N. J.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.
Watson-Stillman Co., The, New York.
Williams Foundry & Machine Co., Akron, O.

Pumps.

Adamson Machine Co., The, Akron, Ohio.
Allen Machine Co., Erie, Pa.
Birmingham Iron Foundry, Derby, Conn.
Buffalo Foundry & Machine Co., Buffalo, N. Y.
Burroughs Co., The, Newark, N. J.
Devine, J. P., Co., Buffalo, N. Y.
Dunning & Boschert Press Co., Inc., Syracuse, N. Y.
Farrel F. & M. Co., Ansonia, Conn.
Southwark Foundry & Machine Co., Philadelphia, Pa.
Watson-Stillman Co., The, New York.

Pumps—Centrifugal.

Southwark Foundry & Machine Co., Philadelphia, Pa.

Pumps—Vacuum.

Buffalo Fdy. & Mach. Co., Buffalo, N. Y.
Devine, J. P., Co., Buffalo, N. Y.

Racks and Frames.

Hoggson & Pettis Mfg. Co., New Haven, Conn.

Reclaiming Machinery.

Adamson Machine Co., The, Akron, Ohio.
Allen Machine Co., Erie, Pa.
American Process Co., New York.
Biggs Boiler Works Co., The, Akron, Ohio.
Birmingham Iron Foundry, Derby, Conn.
Buffalo Fdy. & Mach. Co., Buffalo, N. Y.
Devine, J. P., Co., Buffalo, N. Y.

For Complete Addresses See Advertisements—Index Page 112

Utility Manufacturing Co.

CUDAHY - - - WISCONSIN

Molds and Cores

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A General Line of Steel Molds and Dies for Mechanical and Molded

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We Specialize in

SOLE AND HEEL MOLDS

WE ALSO MAKE HEEL BURRS

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Peerless High Speed Crude Rubber Slicing Machine

will save 5 to 15 men's time. If your capacity is 500 pounds or 50,000 pounds per day it will pay you to install the Peerless.

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Peerless Tire Section Cutters **Peerless High Speed Hack Saws**

Peerless Power and Duplex Hand Blades

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RUBBER BUYERS' DIRECTORY — Continued

Reclaiming Machinery—Cont'd.

Farrel F. & M. Co., Ansonia, Conn.
Housatonic M. & T. Co., Bridgeport, Conn.
Taylor, Stiles & Co., Riegelsville, N. J.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

Reclaiming Water Separators.

American Process Co., New York City.
Buffalo Foundry & Machine Co., Buffalo, N. Y.
Devine, J. P., Co., Buffalo, N. Y.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

Recording Instruments.

For Pressure and Temperature.

American Schaeffer & Budenberg Corp., Brooklyn, N. Y.
Bristol & Co., Waterbury, Conn.
Randall, Frank E., Waltham, Mass.
Schaeffer & Budenberg Co., The, Brooklyn, N. Y.
Yarnall-Waring Co., Philadelphia, Pa.

Refiners.

Allen Machine Co., Erie, Pa.
Birmingham Iron Foundry, Derby, Conn.
Farrel Foundry & Machine Co., Ansonia, Conn.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

Repair Equipment for Rubber Footwear.

Hoggson & Pettis Mfg. Co., The, New Haven, Conn.
Miller, Chas. E., Anderson, Ind.

Riveters.

Watson-Stillman Co., The, New York.

Rivets.

Sessions, J. H., & Son, Bristol, Conn.

Rollers and Stitchers—Hand.

Hoggson & Pettis Mfg. Co., New Haven, Conn.
Miller, Chas. E., Anderson, Ind.
Wellman Co., Medford, Mass.

Rolls—Chilled.

Akron Rubber Mold & Machine Co., Akron, Ohio.
Allen Machine Co., Erie, Pa.
Birmingham Iron Foundry, Derby, Conn.
Curtis & Marble Mch. Co., Worcester, Mass.
Farrel Foundry & Machine Co., Ansonia, Conn.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

Rubber Covering Machines.

New England Butt Co., Providence, R. I.

Rubber Scrap Cutters.

Taylor, Stiles & Co., Riegelsville, N. J.

Scleroscopes.

Shore Instrument & Mfg. Co., The, Jamaica, N. Y.

Sewing Machines.

Curtis & Marble Mch. Co., Worcester.

Shafting.

Adamson Machine Co., The, Akron, Ohio.
Allen Machine Co., Erie, Pa.
Birmingham Iron Fdry., Derby, Conn.
Farrel F. & M. Co., Ansonia, Conn.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

Sheet Metal Specialties

Brass Goods Mfg. Co., Brooklyn, N. Y.

Sherardizing.

New Haven Sherardizing Co., New Haven, Conn.

Shoe Cars and Sticks.

Birmingham Iron Foundry, Derby, Conn.
Hoggson & Pettis Mfg. Co., The, New Haven, Conn.
Wellman Co., Medford, Mass.

Sifters—Dry.

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Day, J. H. Co., Cincinnati, Ohio.

Skiving Machines.

Allen Machine Co., Erie, Pa.
United Shoe Machinery Corporation, Boston, Mass.

Slitting and Re-Winding Machines.

Cameron Machine Co., Brooklyn, N. Y.

Solvent Recovery Apparatus.

Benzine Condensation Co., New York.
Buffalo Foundry & Machine Co., Buffalo, N. Y.
Devine, J. P., Co., Buffalo, N. Y.

Special Machinery.

Akron Equipment Co., The, Akron, O.
Akron Gear & Engineering Co., The, Akron, Ohio.
Akron Machine, Mold, Tool & Die Co., Akron, Ohio.
Akron Rubber Mold & Mach. Co., Akron, Ohio.
Allen Machine Co., Erie, Pa.
Banner Machine Co., The, Columbiana, Ohio.
Biggs Boiler Works Co., The, Akron, Ohio.
Birmingham Iron Foundry, Derby, Conn.
Black Rock Mfg. Co., Bridgeport, Conn.
De Mattia Bros., Garfield, N. J.
Farrel Foundry & Machine Co., Ansonia, Conn.
Frans Foundry & Machine Co., Akron, Ohio.
Hoggson & Pettis Mfg. Co., The, New Haven, Conn.
Kuhlke Machine Co., Akron, Ohio.
Smith, H. Monroe, Passaic, N. J.
Terkelsen Machine Co., Boston, Mass.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.
Williams Foundry & Machine Co., The, Akron, Ohio.
Wills, Arthur Jackson, North Brookfield, Mass.

Spreaders.

Adamson Machine Co., The, Akron, Ohio.
Banner Machine Co., The, Columbiana, Ohio.
Birmingham Iron Foundry, Derby, Conn.
New England Butt Co., Providence, R. I.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

Sprockets.

Spring Silent Chain. Compensating.
Hoggson & Pettis Mfg. Co., The, New Haven, Conn.

Steel Stampings.

Sessions, J. H., & Son, Bristol, Conn.

Steel Stamps.

Hoggson & Pettis Mfg. Co., New Haven, Conn.
Wellman Co., Medford, Mass.

Stitchers.

Akron Rubber Mold & Machine Co., Akron, Ohio.
Hoggson & Pettis Mfg. Co., New Haven, Conn.

Stock Shells.

Gammeter, W. F., Co., The, Cadiz, Ohio.

Strip Cutters.

Birmingham Iron Foundry, Derby, Conn.
Cameron Machine Co., Brooklyn, N. Y.
New England Butt Co., Providence, R. I.
Spadone Machine Co., Inc., New York.

Stripping Tables.

Akron Standard Mold Co., Akron, Ohio.
Banner Machine Co., The, Columbiana, Ohio.
Williams Foundry & Machine Co., The, Akron, Ohio.

Swing Joints.

Adamson Machine Co., The, Akron, Ohio.
Allen Machine Co., Erie, Pa.
Flexo Supply Co., St. Louis, Mo.
Williams, Franklin, Inc., New York.

Tachometers.

American Schaeffer & Budenberg Corp., Brooklyn, N. Y.
Schaeffer & Budenberg Mfg. Co., The, Brooklyn, N. Y.

Tanks, Storage—Oil and Gasoline.

Biggs Boiler Works Co., Akron, Ohio.

Testing Machines.

Perkins, B. F., & Son, Inc., Holyoke, Mass.
Shore Instrument & Mfg. Co., The, Jamaica, N. Y.

Thermometers.

American Schaeffer & Budenberg Corp., Brooklyn, N. Y.
Schaeffer & Budenberg Mfg. Co., The, Brooklyn, N. Y.

Tire Building Equipment.

Adamson Machine Co., The, Akron, Ohio.
Akron Equipment Co., The, Akron, O.
Akron Rubber Mold & Machine Co., Akron, Ohio.
Akron Standard Mold Co., Akron, Ohio.
Allen Machine Co., Erie, Pa.
Banner Machine Co., The, Columbiana, Ohio.
Birmingham Iron Fdy., Derby, Conn.
De Mattia Bros., Inc., Garfield, N. J.
Farrel Foundry & Machine Co., Ansonia, Conn.
Thropp's, John E., Sons So., The, Trenton, N. J.
Williams Fdy. & Mach. Co., Akron, O.

Tire Building Machines.

Banner Machine Co., The, Columbiana, Ohio.
Thropp's, John E., Sons Co., The, Trenton, N. J.

Tire Building Stands.

Banner Machine Co., The, Columbiana, Ohio.
De Mattia Bros., Garfield, N. J.
Williams Foundry & Machine Co., The, Akron, Ohio.

Tire Fabric (Cord) Machine.

Olier, Etablisements A., Clermont-Ferrand, France.

Tire Lasts.

Miller, Chas. E., Anderson, Ind.
Williams Foundry & Machine Co., The, Akron, Ohio.

Tire Machine Drums.

Gammeter, W. F., Co., The, Cadiz, Ohio.

Tire Presses.

Adamson Machine Co., The, Akron, Ohio.
Akron Equipment Co., The, Akron, Ohio.
Allen Machine Co., Erie, Pa.
Birmingham Iron Foundry, Derby, Conn.
Dunning & Boschert Press Co., Inc., The, Syracuse, N. Y.
Farrel Foundry & Machine Co., Ansonia, Conn.
Miller, Chas. E., Anderson, Ind.
Southwark Foundry & Machine Co., Philadelphia, Pa.
Watson-Stillman Co., The, New York.
Williams Foundry & Machine Co., The, Akron, Ohio.

Tire Rebuilding and Repair Equipment.

Akron Rubber Mold & Mach. Co., The, Akron, O.
Biggs Boiler Works Co., The, Akron, O.
Frans Foundry & Machine Co., Akron, Ohio.
Hoggson & Pettis Mfg. Co., The, New Haven, Conn.
Miller, Chas. E., Anderson, Ind.
Williams, F. & M. Co., Akron, Ohio.

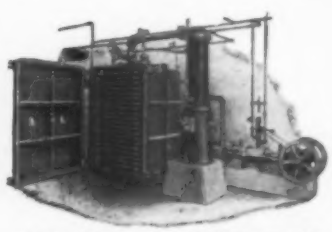
Tire Vulcanizing Presses.

The Adamson Machine Co., Akron, O.
Akron Equipment Co., The, Akron, O.
Allen Machine Co., Erie, Pa.
Birmingham Iron Foundry, Derby, Conn.
Southwark Foundry & Machine Co., Philadelphia, Pa.
Williams, F. & M. Co., Akron, Ohio.

Tire Wrapping Machines.

Adamson Machine Co., The, Akron, Ohio.
Akron Standard Mold Co., Akron, Ohio.
Allen Machine Co., Erie, Pa.
Banner Machine Co., The, Columbiana Ohio.
Miller, Chas. E., Anderson, Ind.
Terkelsen Machine Co., Boston, Mass.
Thropp's, John E., Sons Co., Trenton N. J.

For Complete Addresses See Advertisements—Index Page 112



"Buflovak" Vacuum Shelf Dryer with Condenser and Vacuum Pump

Vacuum Dryers, Evaporators, Chemical Apparatus, Distillation Apparatus, Copper Equipment.

STRENGTH AND RESILIENCY IN VACUUM DRIED RUBBER

The extremely low temperature and high vacuum at which rubber is dried in "Buflovak" Vacuum Dryers absolutely prevent overheating and oxidation. Consequently there is no risk of impairing the natural resiliency and strength of the rubber. Other advantages are economy of time and reduced labor costs.

"Buflovak" Dryers dry all kinds of sheet rubber, reclaimed rubber, rubber compounds, etc.

Buffalo Foundry & Machine Company

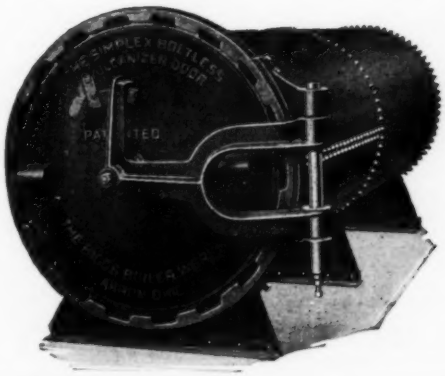
1577 Fillmore Ave., Buffalo, N. Y. **New York Office, 17 Battery Place**

BIGGS VULCANIZERS

The "cure" for your troubles

BOILER WORKS CO. The Biggs EST. 1887 AKRON OHIO

The Standard for Comparison



WHEN speaking of Vulcanizers a great many manufacturers use Biggs as a standard for comparison.

This is a very natural recognition of the fact that we have been installing Vulcanizers in the principal rubber factories ever since the industry started on its great era of development, and they have proven their outstanding merit in long service.

Drop us a line, telling us of your Vulcanizer needs. It will not obligate you in any way, and it will make sure of your getting a figure on the kind of equipment you ought to have.

THE BIGGS BOILER WORKS COMPANY, *Case Ave. and B. & O. R. R.*, AKRON, OHIO

BIGGS TANKS FOR OIL AND GASOLINE STORAGE

"Made Right—Always Tight"

Write for Price Lists covering 38 standard sizes

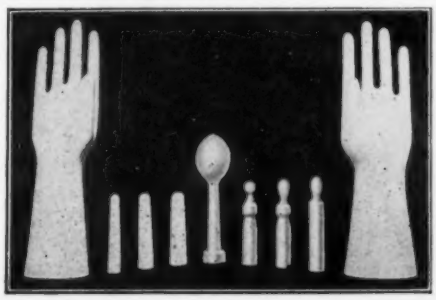
THE BIGGS BOILER WORKS CO., Tank Dept., Akron, O.

S. P. VITRIFIED PORCELAIN FORMS

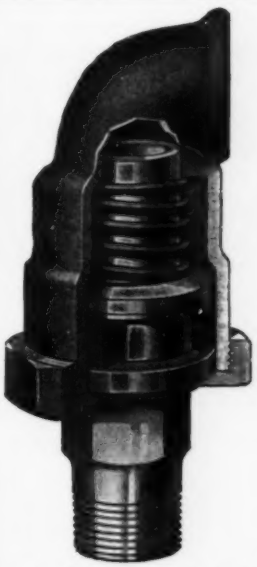
GUARANTEED AGAINST CRAZING

Largest exclusive manufacturers of Vitrified Porcelain forms for Rubber Dipped Goods. Most manufacturers use our forms. Repeat orders testify to high quality.

Manager's experience 18 years. Write us your wants.



SEVILLE PORCELAIN CO., SEVILLE, OHIO



TUXEDA SWING JOINTS

Installed on your hot plate presses will increase your production and reduce your steam consumption.

A trial will convince you.

A Guaranteed Solution for Your Flexible Connection Problems

MANUFACTURED BY

FRANKLIN WILLIAMS, Inc.

41 Cortlandt St. NEW YORK

RUBBER BUYERS' DIRECTORY — Continued

Transmission Machinery.

Allen Machine Co., Erie, Pa.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Birmingham Iron Foundry, Derby, Conn.
Farrel Foundry & Machine Co., Ansonia, Conn.

Tread Making Machines.

Allen Machine Co., Erie, Pa.
Birmingham Iron Foundry, Derby, Conn.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

Trimmers.

Banner Machine Co., The, Columbians, Ohio.
Morris, T. W., Chicago, Ill.
Willis, Arthur Jackson, North Brookfield, Mass.

Tube Wrapping Machines.

Akron Rubber Mold & Machine Co., Akron, Ohio.
Akron Standard Mold Co., Akron, Ohio.
Allen Machine Co., Erie, Pa.
Banner Machine Co., The, Columbians, Ohio.
Black Rock Mfg. Co., The, Bridgeport Conn.
Williams Foundry & Machine Co., The, Akron, Ohio.

Tubing Machines.

Adamson Machine Co., Akron, O.
Akron Rubber Mold & Machine Co., Akron, O.
Allen Machine Co., Erie, Pa.
Farrel Foundry & Machine Co., Ansonia, Conn.
Housatonic Mach. & Tool Co., Bridgeport, Conn.
Royle, John, & Sons, Paterson, N. J.
Williams Foundry & Machine Co., Akron, Ohio.

Turbines—Steam.

Allis-Chalmers Mfg. Co., Milwaukee, Wis.

Vacuum Cloth Impregnating Equipment.

Banner Machine Co., The, Columbians, Ohio.
Buffalo Foundry & Machine Co., Buffalo, N. Y.
Devine, J. P., Co., Buffalo, N. Y.
Shaw, Francis, & Co., Ltd., Manchester, England.

Valve Grinders.

Pittsburgh Valve, Foundry & Construction Co., Pittsburgh, Pa.
Quaker City Rubber Co., Philadelphia, Pa.

Valves.

Burroughs Co., The, Newark, N. J.
Dunning & Boschert Press Co., Inc., The, Syracuse, N. Y.
Pittsburgh Valve, Foundry & Construction Co., Pittsburgh, Pa.
Southwark Foundry & Machine Co., Philadelphia, Pa.
Utility Manufacturing Co., Cudahy, Wis.
Yarnall-Waring Co., Philadelphia, Pa.

Valves (Reducing).

Mason Regulator Co., Dorchester, Mass.

Valves—Two Pressure

Pittsburgh Valve, Foundry & Construction Co., Pittsburgh, Pa.
Yarnall-Waring Co., Philadelphia, Pa.

Varnishing Machines.

Birmingham Iron Foundry, Derby, Conn.

Vulcanizers.

Adamson Machine Co., Akron, O.
Akron Equipment Co., The, Akron, Ohio.
Akron Rubber Mold & Machine Co., Akron, O.
Allen Machine Co., Erie, Pa.
Bigge Boiler Works Co., Akron, O.
Birmingham Iron Foundry, Derby, Conn.
Devine, J. P., Co., Buffalo, N. Y.
Farrel F. & M. Co., Ansonia, Conn.
Fisk Rubber Co., Chicopee Falls, Mass.
Miller, Chas. E., Anderson, Ind.
Southwark Fdy. & Mach. Co., Phila, Pa.
Thropp's, John E., Sons Co., Trenton, N. J.

Vulcanizers—Continued.

Thropp, William R., Sons' Co., Trenton, N. J.
Williams F. & M. Co., Akron, Ohio.

Washers.

Adamson Machine Co., The, Akron, Ohio.
Allen Machine Co., Erie, Pa.
Birmingham Iron Foundry, Derby, Conn.
Buffalo Foundry & Machine Co., Buffalo, N. Y.
Devine, J. P., Co., Buffalo, N. Y.
Farrel F. & M. Co., Ansonia, Conn.
Shaw, Francis, & Co., Ltd., Manchester, England.
Thropp's, John E., Sons Co., Trenton, N. J.
Thropp, William R., Sons' Co., Trenton, N. J.
Vaughn Machinery Co., The, Cuyahoga Falls, Ohio.

Washers—Light Steel for Rubber Heels.

Sessions, J. H., & Son, Bristol, Conn.

Worm Drives

Cleveland Worm and Gear Co., The, Cleveland, Ohio.

Wrapping Machines.

Adamson Machine Co., Akron, O.
Allen Machine Co., Erie, Pa.
Banner Machine Co., The, Columbians, Ohio.
Birmingham Iron Foundry, Derby, Conn.
Farrel F. & M. Co., Ansonia, Conn.
Miller, Chas. E., Anderson, Ind.

Wrapping Machines.

For Wrapping Bundles of Tires, Hose and Wire.
Terkelson Machine Co., Boston, Mass.

Wrapping Machines—Paper.

Terkelson Machine Co., Boston, Mass.

For Complete Addresses See Advertisements—Index Page 112

SECOND-HAND MACHINERY

Albert, L., & Son, Trenton, N. J.
McGrory, Philip, Trenton, N. J.
Norton, M., & Co., Medford, Mass.
Rubber Machinery & Equipment Co., Newark, N. J.
United Rubber Machinery Exchange, Newark, N. J.

RAW MATERIALS AND SUPPLIES

Accelerators.

American Oil & Supply Co., Trenton, N. J.
Bullock, E. L., & Sons, Inc., New York.
Butcher, L. H., Co., Inc., New York. (Vul Ko Cene.)
Dovan Chemical Corporation, New York.
Greeff, R. W., & Co., Inc., New York.
Klipstein, A., & Co., New York.
McNulty, Joseph A., New York.
National Aniline & Chemical Co., New York.
Naugatuck Chemical Co., Naugatuck, Conn. (N. C. C.)
Pfaltz & Bauer, Inc., New York.
Roessler & Hasslacher Chemical Co., New York.
Rubber Service Laboratories Co., The, Akron, Ohio.
States Metals Co., New York.
Tidewater Chemical Co., Inc., New York.
Vanderbilt, R. T., Co., New York.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Acids.

Bullock, E. L., & Sons, Inc., New York.
Cooper, Chas., & Co., New York.
Greeff, R. W., & Co., Inc., New York.
Klipstein, A., & Co., New York.
National Aniline & Chemical Co., New York.
Naugatuck Chemical Co., Naugatuck, Conn.
Pfaltz & Bauer, Inc., New York.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Acids—Sulphuric

Klipstein, A., & Co., New York.
Mineral Point Zinc Co., Chicago, Ill.
New Jersey Zinc Co., New York.
Pfaltz & Bauer, Inc., New York.
Scheel, William H., New York.

R&H CHEMICALS

For the Rubber Industry

Acetone (pure and com'l.)
Alumina Earth
Antimony Sulphuret
(Vermilion-Crimson-Golden)
15-17% Sulphur Free
Carbon Tetrachloride
Colors (green and yellow)
Iron Oxides
Magnesium Carbonate
Mica
Sulphur
Talcum
Whitings
Zinc Oxides

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HEXYMETHYLENE TETRAMINE
FORMALDEHYDE ANILINE
DIPHENYL GUANIDINE
ETHYLIDINE ANILINE
ALDEHYDE AMMONIA
THIOCARBANILID

FORMALDEHYDE
SULPHUR CHLORIDE

We are licensed under U. S. Patent Numbers 1,149,580-126,469 to Hofmann & Gottlob, and under U. S. Patent No. 1,411,231 and Canadian Patent No. 227,316 to Weiss.

Special Laboratory Service Maintained

The Roessler & Hasslacher Chemical Co.

Chicago Philadelphia NEW YORK Trenton Boston
New Orleans Pittsburgh Kansas City San Francisco Cleveland

DIPHENYLGUANIDINE
AND
XLO ACCELERATOR
Powerful Versatile Harmless Durable

U. S. Patents No. 1,411,231 and No. 1,149,580.
Canadian Patent 227,316.

DOVAN CHEMICAL CORPORATION
Established 1920
30 Church Street New York

Represented by
J. A. Kendall, Akron, Ohio—J. E. Odell, Boston, Mass.
T. E. O'Reilly, Ltd., Toronto—H. T. Kraft, New York
Martin, Hoyt & Milne, San Francisco and Los Angeles.

OUR SERVICE YOUR SUCCESS
THE P. E. WELTON ENGINEERING CO.
46 S. BROADWAY AKRON, OHIO

Successors to
THE AKRON ENGINEERING CO.

Rubber Factory and Power Plant Specialists.
We Can Solve Your Annoying Problems.
Can Sell, Lease, Build, Equip and Operate Your Plants.

SPECIALISTS IN TIRE MOLD DESIGNS.
LET US PROVE IT.

"NATIONAL"
RUBBER ACCELERATORS
DIPHENYLGUANIDINE
TRIPHENYLGUANIDINE
THIOCARBANILIDE
ANILINE OIL

THESE "National" organic materials are manufactured specifically for the rubber trade. Their superior qualities

Absolute Commercial Purity
Maximum Strength
Fineness of Division and Uniformity

are assured by rigid specifications and inspection controlling their manufacture.

NATIONAL ANILINE & CHEMICAL COMPANY
INCORPORATED
40 Rector St., New York, N. Y.

NATIONAL U.S.A. QUALITY

THE WELLMAN COMPANY
are manufacturers of
THE WELLMAN SOLE CUTTING MACHINE
AND
THE PATTEN SOLE CUTTING MACHINE

for cutting soles, taps and other irregular shapes at any bevel from 27° to 90° from sheet stock. They are also in a position to work out many of your engineering problems, to design and build any tool or light machine needed in your factory.

Send blue prints of requirements to

WELLMAN COMPANY
Engineers and Machinists
MEDFORD, MASS.

The Efficiency Rubber Gauge
(The Randall and Stickney Thickness Gauge)

With this Gauge the thickness of rubber is determined within .001 inch, and there is no personal factor to be considered.

This instrument has been in use by the leading Rubber Manufacturers of this country and Canada for fifteen years.

Operated by a Standard Pressure on a Standard Area
Send for Descriptive Circular and Prices
FRANK E. RANDALL, Waltham, Mass.

RUBBER BUYERS' DIRECTORY—Continued

Alba Whiting.
Harshaw, Fuller & Goodwin Co., The Cleveland, Ohio.
Industrial Chemical Co., New York.
Roessler & Hasslacher Chemical Co., New York.
Whittaker, Clark & Daniels, Inc., New York.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Aluminum Flake.
Aluminum Flake Co., The, Akron, O.
Bullock, E. L., & Sons, Inc., New York.
Butcher, L. H., Co., Inc., New York.
Rubber Service Laboratories Co., Akron, Ohio.
Scheel, William H., New York.
Whittaker, Clark & Daniels, Inc., New York.

Aniline
American Oil & Supply Co., Trenton, N. J.
Bullock, E. L., & Sons, Inc., New York.
Innis, Speiden & Co., Inc., New York City.
Klipstein, A., & Co., New York.
National Aniline & Chemical Co., New York.
Naugatuck Chemical Co., Naugatuck, Conn.
Pfaltz & Bauer, Inc., New York.
Rubber Service Laboratories Co., Inc., The, Akron, Ohio.
Scheel, William H., New York.
Tidewater Chemical Co., Inc., New York.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Antimony, Sulphurets of.
Golden and Crimson.
American Oil & Supply Co., Trenton, N. J.
Atlas Chemical Co., Waltham, Mass.
Bullock, E. L., & Sons, Inc., New York.
Butcher, L. H., Co., Inc., New York.
Cooper, Charles, & Co., New York.
Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
Industrial Chemical Co., New York.
Innis, Speiden & Co., Inc., New York City.
Klipstein, A., & Co., New York.

Antimony—Sulphurets of—Continued.
Naugatuck Chemical Co., Naugatuck, Conn.
Pfaltz & Bauer, Inc., New York.
Rare Metal Products Co., Belleville, N. J.
Roessler & Hasslacher Chemical Co., New York.
Rubber Service Laboratories, The, Akron, Ohio.
Scheel, William H., New York.
States Metals Co., New York.
Tidewater Chemical Co., Inc., New York.
Typke & King, Ltd., Mitcham, England.
Tyson Bros., Inc., Woodbridge, N. J.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Arsenic, Yellow
Butcher, L. H., Co., Inc., New York.

Artificial Rubber.
Ashley, T. C., & Co., Boston, Mass.
Carter Bell Mfg. Co., New York.
Scheel, William H., New York.
Stamford Rubber Supply Co., Stamford, Conn.
Typke & King, London, England.
Tyson Bros., Inc., Woodbridge, N. J.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Asbestine.
American Oil & Supply Co., Trenton, N. J.
Bullock, E. L., & Sons, Inc., New York.
Butcher, L. H., Co., Inc., New York.
Harshaw, Fuller & Goodwin Co., The Cleveland, Ohio.
Innis, Speiden & Co., Inc., New York City.
International Products Corp., Trenton, N. J.
Scheel, William H., New York.
Tidewater Chemical Co., Inc., New York.
Whittaker, Clark & Daniels, Inc., New York.
Williams, C. K., & Co., Easton, Pa.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Balata.
Astlett & Co., H. A., New York.
Chipman, R. L., New York.
Dunbar, J. Frank, Co., Inc., New York.
Hardy, R. S., Co., New York City.
Jacoby, Ernest, Boston, Mass.

Balata—Continued.
Pell & Dumont, New York.
Wood, Charles E., New York.

Barium Dust.
Vanderbilt, R. T., Co., New York.

Barium Sulphate—See Barytes
Barium Sulphate Precipitated—See Blanc Fixe

Barytes.
American Oil & Supply Co., Trenton, N. J.
Bullock, E. L., & Sons, Inc., New York.
Butcher, L. H., Co., Inc., New York.
Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
Innis, Speiden & Co., Inc., New York City.
International Products Corp., Trenton, N. J.
Klipstein, A., & Co., New York.
National Pigments & Chemical Co., St. Louis, Mo.
Osborn, C. J., Co., New York.
Pfaltz & Bauer, Inc., New York.
Roessler & Hasslacher Chemical Co., New York.
Scheel, William H., New York, N. Y.
Tidewater Chemical Co., Inc., New York.
Tyson Bros., Inc., Woodbridge, N. J.
Vanderbilt, R. T., Co., New York.
Waldo, E. M., & F., Inc., New York.
Whittaker, Clark & Daniels, Inc., New York.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Basofor.
Waldo, E. M., & F., Inc., New York.

Benzol.
Bullock, E. L., & Sons, Inc., New York.
Cabot, Samuel, Boston, Mass.
Cooper, Charles, & Co., New York.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Klipstein, A., & Co., New York.
Scheel, William H., New York.
Tidewater Chemical Co., Inc., New York.
Tyson Bros., Inc., Carteret, N. J.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Black Hypo.
Bullock, E. L., & Sons, Inc., New York.
Butcher, L. H., Co., Inc., New York.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Pfaltz & Bauer, Inc., New York.
Scheel, William H., New York.
Tidewater Chemical Co., Inc., New York
Typke & King, London, England.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Blanc Fixe.
Blanc fix Co., New York.
Bullock, E. L., & Sons, Inc., New York.
Butcher, L. H., Co., Inc., New York.
Cooper, Charles, & Co., New York.
Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
Innis, Speiden & Co., Inc., New York City.
Klipstein, A., & Co., New York.
National Pigments & Chemical Co., St. Louis, Mo.
Tidewater Chemical Co., Inc., New York.
Vanderbilt, R. T., Co., New York.
Waldo, E. M., & F., Inc., New York.
Whittaker, Clark & Daniels, Inc., New York.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Bolted Lime.
American Oil & Supply Co., Trenton, N. J.
Bullock, E. L., & Sons, Inc., New York.
Butcher, L. H., Co., Inc., New York.
International Products Corp., Trenton, N. J.
Pfaltz & Bauer, Inc., New York.
Tidewater Chemical Co., Inc., New York.
Whittaker, Clark & Daniels, Inc., New York.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Bone Ash.
Cooper, Chas., & Co., New York.

Cadmium Yellow.
Bullock, E. L., & Sons, Inc., New York.
Butcher, L. H., Co., Inc., New York.
Harshaw, Fuller & Goodwin Co., The Cleveland, Ohio.
Innis, Speiden & Co., Inc., New York City.

For Complete Addresses See Advertisements—Index Page 112

CRUDE RUBBER

IF IT PERTAINS TO OR

COMMUNICATE WITH S. BIRKENSTEIN & SONS CHICAGO PHILADELPHIA or NEW YORK MINNEAPOLIS

SCRAP RUBBER

QUALITY SEALS

T&K

GOLDEN CRIMSON VERMILION

TYPKE & KING'S

ANTIMONIES

ORIGINAL STANDARDS UNEXCELLED

YOUR GUARANTEE

CROWN CHEMICAL WORKS TYPKE & KING LTD MITCHAM COMMON

(See Page 32)

WE ARE EXCLUSIVE U. S. AGENTS CARRYING NEW YORK STOCKS LOOK FOR THE SEAL—NOT GENUINE WITHOUT IT

SUPERFINE RED
Absolutely nothing better.

OXIDES SOFT TEXTURE
Prices right. No premium for fancy names.

ULTRAMARINE BLUE and ENGLISH VERMILION
SULPHUR FREE. SUPERIOR TO DOMESTIC MAKE. CHOICEST EUROPEAN STANDARDS FOR RUBBER MIXING

LAGOS and NIGER PALM OIL AVOILAS COMPOUND

VUL KO CENE, The Accelerator

WHITES
Asbestine, Barytes, Blanc Fixe, Clay, Fossil Flour, Lime, Lithopone, Magnesia, Mica, Soapstone, Talc, Whiting, Zinc Oxide, etc.

All COLORS For Hot or Cold Cures
RED, ORANGE, YELLOW, BLUE, GREEN
Brilliant and Concentrated.

BLACKS
Bone, Carbon, Hypo, Lamp, Iron Oxide, Graphite, Hydro Carbon, Vegetable, Vine, "RMR" Solid and Granulated Mineral Rubber, etc.

QUALITY L.H.B.CO. SERVICE

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Established at San Francisco 1890

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VALUE L.H.B.CO. PRICE

MANUFACTURED WEATHER
makes
"Every day a *good* day"
Humidification · Dehumidification
Heating · Ventilation · Purification
Drying
Carrier
Engineering Corporation
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THE RUBBER PRODUCTS CO.
BARBERTON, OHIO
High Grade
DRUGGISTS' SUNDRIES
MOLDED GOODS

STATES BRAND
ANTIMONY SULPHURET
GOLDEN
Standard—15/17% Free Sulphur
Other proportions as desired
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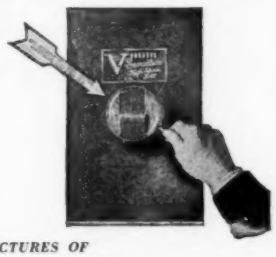
MAGNESIA
THISTLE BRAND
Heavy and Light Calcined Magnesia
INDIA RUBBER YELLOW
Orange Sulphuret
ACCELERATORS
Ethylidene Aniline and Crylene
Stocks carried at
NEW YORK AKRON CHICAGO BOSTON
SAN FRANCISCO
District Representatives:
J. A. Kendall, AKRON, OHIO
R. F. Foote, Port Dalhousie, Canada
J. E. Odell, BOSTON, MASS.
Martin, Hoyt & Milne SAN FRANCISCO, CALIF.
STATES METALS CO., Inc.
30 Church Street NEW YORK CITY

VOORHEES RUBBER MFG CO
TRADE MARK



MANUFACTURES OF
SENSATION BELT. WATER, STEAM AND AIR HOSE. RUB-STEEL VALVES. AND A GENERAL LINE OF MECHANICAL RUBBER GOODS OF ULTIMATE ECONOMY.
MAIN OFFICE AND WORKS
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New York:
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MAGNESIA
WHITTAKER, CLARK & DANIELS, Inc.
250 Front Street, New York

Baird Rubber & Trading Co.
233 BROADWAY, NEW YORK
Telephone 7915 BARCLAY Cable Address: CHAUNBAIR, NEW YORK
TRENTON, N. J., OFFICE: 366 PENNINGTON AVENUE
F. F. FOX, Representative, Telephone 6426 TRENTON
CRUDE RUBBER

RUBBER BUYERS' DIRECTORY — Continued

Cadmium Yellow—Continued.

Pfaltz & Bauer, Inc., New York.
Roessler & Hasslacher Chemical Co., New York.
Tidewater Chemical Co., Inc., New York.
Waldo, E. M., & F., Inc., New York.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Carbon Bisulphide and Tetrachloride.

Bullock, E. L., & Sons, Inc., New York.
Cooper, Charles, & Co., New York.
Dow Chemical Co., The, Midland, Mich.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Innis, Speiden & Co., Inc., New York City.
Klipstein, A., & Co., New York.
National Aniline & Chemical Co., New York.
Pfaltz & Bauer, Inc., New York.
Roessler & Hasslacher Chemical Co., New York.
Tidewater Chemical Co., Inc., New York.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Carbon Black.

Barrett Co., The, New York.
Binney & Smith Co., New York.
Bullock, E. L., & Sons, Inc., New York.
Butcher, L. H., Co., Inc., New York.
Cabot, Godfrey L., Boston, Mass.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Industrial Chemical Co., New York.
Innis, Speiden & Co., Inc., New York City.
Klipstein, A., & Co., New York.
Osborn, C. J., Co., New York.
Pfaltz & Bauer, Inc., New York.
Roessler & Hasslacher Chemical Co., New York.
Scheel, William H., New York.
Seaver & Co., Boston, Mass.
Tidewater Chemical Co., Inc., New York.
West, W. T., Co., Boston, Mass.
Whittaker, Clark & Daniels, Inc., New York.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Carbon Dioxide.

General Carbonic Co., New York, N. Y.

Caustic Soda.

American Oil & Supply Co., Trenton, N. J.
Bullock, E. L., & Sons, Inc., New York.
Cooper, Charles, & Co., New York.
Dow Chemical Co., The, Midland, Mich.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Innis, Speiden & Co., Inc., New York City.
Klipstein, A., & Co., New York.
Scheel, William H., New York.
Tidewater Chemical Co., Inc., New York.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Cement (Rubber).

Canadian Consolidated Rubber Co., Ltd. Montreal, Canada.
Essex Rubber Co., Trenton, N. J.
Hale, Alfred, Rubber Co., Boston, Mass.
New York Belting & Packing Co., N. Y.
United States Rubber Co., New York.

Chemicals and Ingredients.

Ashley, T. C., & Co., Boston, Mass.
Barrett Co., The, New York.
Binney & Smith Co., New York.
Bullock, E. L., & Sons, Inc., New York.
Butcher, L. H., Co., Inc., New York.
Cooper, Charles, & Co., New York.
Greeff, R. W., & Co., Inc., New York.
Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
Innis, Speiden & Co., Inc., New York City.
Klipstein, A., & Co., New York City.
National Aniline & Chemical Co., New York.
Osborn, C. J., Co., New York.
Pfaltz & Bauer, Inc., New York.
Roessler & Hasslacher Chemical Co., New York.
States Metals Co., New York.
Tidewater Chemical Co., Inc., New York.
Tyson Bros., Inc., Woodbridge, N. J.
Vanderbilt, R. T., Co., New York, N. Y.
Waldo, E. M., & F., Inc., New York.
Westmoreland Chemical & Color Co., Philadelphia, Pa.
Whittaker, Clark & Daniels, Inc., New York.
Williams, C. K., & Co., Easton, Pa.
Wishnick-Tumpeer Chemical Co., Chicago Ill.

China Clay.

Bullock, E. L., & Sons, Inc., New York.
Butcher, L. H., Co., Inc., New York.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Innis, Speiden & Co., Inc., New York City.
Pfaltz & Bauer, Inc., New York.
Roessler & Hasslacher Chemical Co., New York.
Rubber Service Laboratories, The, Akron, Ohio.
Scheel, William H., New York, N. Y.
Taintor Co., The, New York.
Tidewater Chemical Co., Inc., New York.
United Clay Mines Corporation, Trenton, N. J.
Vanderbilt, R. T., Co., New York.
Whittaker, Clark & Daniels, Inc., New York.
Williams & Co., C. K., Easton, Pa.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Colors.

Ault & Wiborg Co., The, Cincinnati, Ohio.
Binney & Smith Co., New York.
Bullock, E. L., & Sons, Inc., New York.
Butcher, L. H., Co., Inc., New York.
Cooper Charles, & Co., New York.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Innis, Speiden & Co., Inc., New York City.
Klipstein, A., & Co., New York.
McNulty, Joseph A., New York.
National Aniline & Chemical Co., New York.
Osborn, C. J., Co., New York.
Pfaltz & Bauer, Inc., New York.
Roessler & Hasslacher Chemical Co., New York.
Rubber Service Laboratories, The, Akron, Ohio.
Scheel, William H., New York.
States Metals Co., New York.
Tidewater Chemical Co., Inc., New York
Typke & King, London, England.
Tyson Bros., Inc., Woodbridge, N. J.
Waldo, E. M., & F., Inc., New York.

Colors—Continued.

Westmoreland Chem. & Color Co., Philadelphia, Pa.
Whittaker, Clark & Daniels, Inc., New York.
Williams, C. K., & Co., Easton, Pa.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Colors—Balloon.

Ault & Wiborg Co., The, Cincinnati, Ohio.
Bullock, E. L., & Sons, Inc., New York.
National Aniline & Chemical Co., New York.

Cotton Flock.

Peckham Mfg. Co., The, Newark, N. J.

Cotton Goods.

Ducks and Drills.

Adams, H. J., Co., The, Akron, Ohio.
Callaway Mills, Inc., New York.
Curran & Barry, New York.
Hewins, E. D., Boston, Mass.
Kavanaugh, Geo. W., New York.
Lane, J. H., & Co., New York and Chicago.
Lawrence & Co., New York.

Tire Tape.

Adams, H. J., Co., The, Akron, Ohio.
Kavanaugh, Geo. W., New York.

Hollands.

Kavanaugh, Geo. W., New York.

Osnaburgs.

Adams, H. J., Co., The, Akron, Ohio.
Callaway Mills, Inc., New York.
Curran & Barry, New York.
Kavanaugh, Geo. W., New York.
Lane, J. H., & Co., New York and Chicago.

Sheetings.

Adams, H. J., Co., The, Akron, Ohio.
Callaway Mills, Inc., New York.
Kavanaugh, Geo. W., New York.
Lane, J. H., & Co., New York and Chicago.

Stockinettes.

United States Knitting Co., Pawtucket, R. I.

Tire Fabrics.

Adams, H. J., Co., The, Akron, Ohio.
Bibb Mfg. Co., Macon, Ga.
Brighton Mills, Passaic, N. J.

For Complete Addresses See Advertisements—Index Page 112

DOW

CARBON TETRACHLORIDE 99.7%
CARBON BISULPHIDE 99.9%

Water White Quality for Rubber Makers use 5-10-55-110 Gallon Drums — Dow Tank Cars.

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Various Grades

CAUSTIC SODA 76%
Solid—Flake

CALCIUM CHLORIDE 75%
Solid—Flake

EPSOM SALT
All Grades

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RUBRAX

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Hydro-Carbons

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CARTERET, NEW JERSEY
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Trenton, N. J.

European Agents.
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Queen Insurance Bldg.,
13 Castle Street,
Liverpool, England

THE INTEROCEAN OIL COMPANY
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UNITED STATES KNITTING CO.
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ANTIMONY BARYTES
WHITING MAGNESIA
OXIDE OF IRON
ACCELERATORS

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MANUFACTURERS

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Refinery and Manufacturing Plant: Clearing, Ill.
General Offices—Marquette Building, Chicago

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A New Rubber Softener

THE WOBURN DEGREASING CO.
HARRISON, N. J.

RUBBER BUYERS' DIRECTORY—Continued

Cotton Goods—Continued.

Tire Fabrics—Continued.

Cabarrus Cotton Mills, Kannapolis, N. C.
Caldwell, R. J., Co., Inc., New York.
Callaway Mills, Inc., New York.
Hewins, E. D., Inc., Boston, Mass.
Kavanaugh, Geo. W., New York.
Lane, J. H., & Co., New York and Chicago.
Lawrence & Co., New York.
Marlboro Cotton Mills, Macon, S. C.
Salmon Falls Mfg. Co., Boston, Mass.
Taylor, Armitage & Eagles, Inc., New York.
Ultratex Products Co., Boston, Mass.
Worcester Tire Fabric Co., Worcester, Mass.

Crêpe Soling.

Buckleton & Nourry, Ltd., Liverpool, England.
Hale, Alfred, Rubber Co., Atlantic, Mass.
Hankin, Geo., & Co., London, England.
Henderson, F. B., & Co., New York.

Crude Rubber—Importers and Exporters.

Araujo, J. G., Manaos, Brazil, S. A.
Astlett, H. A., & Co., New York.
Baird Rubber & Trading Co., New York.
Chalfin, Joseph, & Co., Inc., New York.
Hankin, Geo., & Co., London, England.
Henderson, F. B., & Co., New York.
Hirsch, Adolph, & Co., New York.
Muehlstein, H. & Co., Inc., New York.
Sorenson & Nielsen, New York.
Stiles, William H., & Co., New York.
Wilson, Charles T., Co., Inc., New York.

Crude Rubber Brokers.

Anglo Eastern Trading Co., Inc., New York.
Buckleton & Nourry, Ltd., Liverpool, England.
Chipman, R. L., New York.
Dunbar, F. W., & Co., New York.
Dunbar, J. Frank, Co., Inc., New York.
Hardy, Roger S., New York.
Jacoby, Ernest, Boston, Mass.
Pell & Dumont, New York.
Wood, Charles E., New York.

Crude Rubber—Latex.

Buckleton & Nourry, Ltd., Liverpool, England.
Hankin, Geo., & Co., London, England—Byles, W. E., New York, Agent.
Hardy, R. S., Co., New York.
Henderson, F. B., & Co., New York.
Stiles, William H., & Co., New York.
Vanderbilt, R. T., New York, N. Y.

Crude Rubber—Washed and Dried.

Acushnet Process Co., New Bedford, Mass.
Anglo Eastern Trading Co., Inc., New York.
Araujo, J. G., Manaos, Brasil, S. A.
Continental Rubber Co., New York.
Calvet, Pablo & Co., New York, N. Y.
Sorenson & Nielsen, New York.

Diatomite.

Bullock, E. L., & Sons, Inc., New York.
Butcher, L. H., Co., Inc., New York.
Whittaker, Clark & Daniels, Inc., New York.

Fillers.

American Oil & Supply Co., Trenton, N. J.
Bullock, E. L., & Sons, Inc., New York.
Butcher, L. H., Co., Inc., New York.
Innis, Speiden & Co., Inc., New York.
Klipstein, A., & Co., New York.
Pfaltz & Bauer, Inc., New York.
Tidewater Chemical Co., Inc., New York.
Vanderbilt, R. T., New York, N. Y.
Whittaker, Clark & Daniels, Inc., New York.

Fossil Flour—Infusorial Earth.

American Oil & Supply Co., Trenton, N. J.
Bullock, E. L., & Sons, Inc., New York.
Butcher, L. H., Co., Inc., New York.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Pfaltz & Bauer, Inc., New York.
Scheel, William H., New York.
Tidewater Chemical Co., Inc., New York.
Whittaker, Clark & Daniels, Inc., New York.

Gilsonite.

Bullock, E. L., & Sons, Inc., New York.
Klipstein, A., & Co., New York.
Scheel, William H., New York.
Tidewater Chemical Co., Inc., New York.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Graphite.

Bullock, E. L., & Sons, Inc., New York.
Butcher, L. H., Co., Inc., New York.
Innis, Speiden & Co., Inc., New York.
Tidewater Chemical Co., Inc., New York.
Whittaker, Clark & Daniels, Inc., New York.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Green Oxide of Chromium.

Bullock, E. L., & Sons, Inc., New York.
Butcher, L. H., Co., Inc., New York.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Innis, Speiden & Co., Inc., New York.
Roessler & Hasslacher Chemical Co., New York.
Scheel, William H., New York.
Tidewater Chemical Co., Inc., New York.
Waldo, E. M., & F., Inc., New York.
Williams, C. K., & Co., Easton, Pa.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Guayule Rubber.

Continental Rubber Co., New York.
Wilson, Charles T., Co., Inc., New York.

Gutta-Percha.

Astlett, H. A., & Co., New York.
Baird Rubber & Trading Co., New York.
Chipman, R. L., New York.
Dunbar, J. Frank, Co., Inc., New York.
Hankin, Geo., & Co., London, England.
Hardy, R. S., Co., New York City.
Jacoby, Ernest, Boston, Mass.
Pell & Dumont, New York.
Wood, Charles E., New York.

Hard Rubber Dust.

Muehlstein, H., & Co., Inc., New York.
Central Rubber Reclaiming Co., The, Defiance, Ohio.

Hard Rubber Sheet.

Central Rubber Reclaiming Co., The, Defiance, Ohio.

Hexamethylene Tetramine

Bullock, E. L., & Sons, Inc., New York.
Butcher, L. H., Co., Inc., New York.
Roessler & Hasslacher Chemical Co., The, New York.
Tidewater Chemical Co., Inc., New York.

Hydro-Carbon Products.

American Oil & Supply Co., Trenton, N. J.
Bullock, E. L., & Sons, Inc., New York.
Butcher, L. H., Co., Inc., New York.
Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
Innis, Speiden & Co., Inc., New York City.
Ohlmac Paint & Refining Co., Chicago, Ill.
Robertson, H. H., Co., Pittsburgh, Pa.
Scheel, William H., New York.
States Metals Co., New York.
Tidewater Chemical Co., Inc., New York.
Vanderbilt, R. T., Co., New York.
Whittaker, Clark & Daniels, Inc., New York.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Infusorial Earth—See Fossil Flour.

Iron Oxide—See Red Oxide

Lampblack.

Binney & Smith Co., New York.
Bullock, E. L., & Sons, Inc., New York.
Butcher, L. H., Co., Inc., New York.
Cabot, Samuel, Boston, Mass.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Innis, Speiden & Co., Inc., New York City.
Osborn, C. J., Co., New York.
Pfaltz & Bauer, Inc., New York.
Tidewater Chemical Co., Inc., New York.
Tyson Bros., Inc., Woodbridge, N. J.
Whittaker, Clark & Daniels, Inc., New York.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Lead—Blue.

Lead—Sublimed White.

Bullock, E. L., & Sons, Inc., New York.
Butcher L. H. Co. Inc. New York.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Pfaltz & Bauer, Inc., New York.
Roessler & Hasslacher Chemical Co., New York.
Tidewater Chemical Co., Inc., New York.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Lime Flour.

Bullock, E. L., & Sons, Inc., New York.
Butcher, L. H., Co., Inc., New York.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
International Products Corp., Trenton, N. J.
Pfaltz & Bauer, Inc., New York.
Scheel, William H., New York.
Tidewater Chemical Co., Inc., New York.
Whittaker, Clark & Daniels, Inc., N. Y.

Liners, Treated.

Cleveland Mixer & Mfg. Co., The, Cleveland, Ohio.

Litharge.

Bullock, E. L., & Sons, Inc., New York.
Butcher, L. H., Co., Inc., New York.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Innis, Speiden & Co., Inc., New York.
Klipstein, A., & Co., New York.
Pfaltz & Bauer, Inc., New York.
Roessler & Hasslacher Chemical Co., New York.
Scheel, William H., New York.
Tidewater Chemical Co., Inc., New York.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Lithopone.

American Oil & Supply Co., Trenton, N. J.
Blancliff Co., New York.
Bullock, E. L., & Sons, Inc., New York.
Butcher, L. H., Co., Inc., New York.
Greeff, R. W., & Co., Inc., New York.
Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
Innis, Speiden & Co., Inc., New York.
Klipstein, A., & Co., New York.
Mineral Point Zinc Co., Chicago, Ill.
New Jersey Zinc Co., New York.
Osborn, C. J., Co., New York.
Pfaltz & Bauer, Inc., New York.
Scheel, William H., New York.
Tidewater Chemical Co., Inc., New York.
Whittaker, Clark & Daniels, Inc., N. Y.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Magnesia Carbonate

American Oil & Supply Co., Trenton, N. J.
Bullock, E. L., & Sons, Inc., New York.
Butcher, L. H., Co., Inc., New York.
Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
Innis, Speiden & Co., Inc., New York.
Klipstein, A., & Co., New York.
National Aniline & Chemical Co., New York.
Pfaltz & Bauer, Inc., New York.
Roessler & Hasslacher Chemical Co., New York.
Scheel, William H., New York.
States Metals Co., New York.
Tidewater Chemical Co., Inc., New York.
Whittaker, Clark & Daniels, Inc., N. Y.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Magnesia Oxide (Calcined)

Bullock, E. L., & Sons, Inc., New York.
Butcher, L. H., Co., Inc., New York.
Cooper, Chas., & Co., New York.
Innis, Speiden & Co., Inc., New York.
Pfaltz & Bauer, Inc., New York.
Roessler & Hasslacher Chemical Co., New York.
Scheel, William H., New York.
States Metals Co., New York.
Tidewater Chemical Co., Inc., New York.
Whittaker, Clark & Daniels, Inc., New York.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

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We Manufacture a Variety of Shades of

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Extremely strong in coloring power and ground impalpably fine. Also various grades of Talc, Soapstone and Asbestine. Write us for samples and prices.

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FACTORIES: Niagara Falls, Jersey City, Murphysboro, Ill., and Owego, N. Y.

RUBBER BUYERS' DIRECTORY —Continued

Marking and Stencil Ink.

Binney & Smith Co., New York, N. Y.

Mica.

Bullock, E. L., & Sons, Inc., New York.
Butcher, L. H., Co., Inc., New York.
Scheel, William H., New York.
Tidewater Chemical Co., Inc., New York.
Whittaker, Clark & Daniels, Inc., N. Y.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Mineral Rubber.

American Oil & Supply Co., Trenton, N. J.
Barber Asphalt Paving Co., Philadelphia, Pa.
Bullock, E. L., & Sons, Inc., New York.
Butcher, L. H., Co., Inc., New York.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Innis, Speiden & Co., Inc., New York.
International Products Corp., Trenton, N. J.
Inter-Ocean Oil Co., New York.
Ohimac Paint & Refining Co., Chicago, Ill.
Pioneer Asphalt Co., Lawrenville, Ill.
Pure Metal Products Co., Belleville, N. J.
Robertson, H. H., Co., Pittsburgh, Pa.
Scheel, William H., New York.
States Metals Co., New York.
Synthetic Products Co., Cleveland, Ohio.
Tidewater Chemical Co., Inc., New York.
Vanderbilt, R. T., Co., New York.
Whittaker, Clark & Daniels, Inc., New York.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Oils—Palm

Butcher, L. H., Co., Inc., New York.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Oils — Tar, Pine, Creosote, Rosin, Turpentine.

American Oil & Supply Co., Trenton, N. J.
Bullock, E. L., & Sons, Inc., New York.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Industrial Chemical Co., New York.
International Products Corp., Trenton, N. J.
West Co., Inc., H. T., Boston.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Oils—Vegetable.

Bullock, E. L., & Sons, Inc., New York.
Butcher, L. H., Co., Inc., New York.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Tidewater Chemical Co., Inc., New York.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Petrolatum.

Bullock, E. L., & Sons, Inc., New York.
Tidewater Chemical Co., Inc., New York.
Vanderbilt, R. T., Co., New York.

Pigments.

Aluminum Flake Co., Akron, Ohio.
American Oil & Supply Co., Trenton, N. J.
Bullock, E. L., & Sons, Inc., New York.
Butcher, L. H., Co., Inc., New York.
Cooper, Chas., & Co., New York.
Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
Industrial Chemical Co., New York.
Innis, Speiden & Co., Inc., New York City.

Pigments—Continued.

Klipstein, A., & Co., New York City.
Mineral Point Zinc Co., Chicago, Ill.
National Pigments & Chemical Co., St. Louis, Mo.
New Jersey Zinc Co., The, New York.
Pfaltz & Bauer, Inc., New York.
Roessler & Hasslacher Chemical Co., New York.
Scheel, William H., New York.
Tidewater Chemical Co., Inc., New York.
Waldo, E. M. & F., Inc., New York.
Westmoreland Chemical & Color Co., Philadelphia, Pa.
Whittaker, Clark & Daniels, Inc., New York.
Williams, C. K., & Co., Easton, Pa.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Pine Tar.

Bullock, E. L., & Sons, Inc., New York.
Harshaw, Fuller & Goodwin Co., The, Cleveland, Ohio.
Tidewater Chemical Co., Inc., New York.
West, H. T., Co., Boston, Mass.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Pitch.

Bullock, E. L., & Sons, Inc., New York.
Rubber Service Laboratories, The, Akron, Ohio.
Scheel, William H., New York.
Tidewater Chemical Co., Inc., New York.
West, H. T., Co., Boston, Mass.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Precipitated Chalk.

Bullock, E. L., & Sons, Inc., New York.
Industrial Chemical Co., New York.
Innis, Speiden & Co., Inc., New York City.
International Products Corp., Trenton, N. J.
National Pigments & Chemical Co., St. Louis, Mo.
Pfaltz & Bauer, Inc., New York.
Roessler & Hasslacher Chemical Co., New York.
Tidewater Chemical Co., Inc., New York.
Whittaker, Clark & Daniels, Inc., New York.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

Pumice Stone.

Bullock, E. L., & Sons, Inc., New York.
Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
Pfaltz & Bauer, Inc., New York.
Whittaker, Clark & Daniels, Inc., New York.
Wishnick-Tumpeer Chemical Co., Chicago, Ill.

"Quaker" Whiting.

Vanderbilt, R. T., Co., New York.
Whittaker, Clark, & Daniels, Inc., New York.

Reclaimed Rubber.

Appleton Rubber Co., Boston, Mass.
Baird Rubber & Trading Co., New York (Agent).
Central Rubber Reclaiming Co., The, Defiance, Ohio.
Clapp, E. H., Rubber Co., Boston, Mass.
Dunbar, J. Frank, Co., Inc., New York.
McGrory, Philip, Trenton, N. J. (Agent.)
Nearpara Rubber Co., Trenton, N. J.
New Jersey Rub. Co., Lambertville, N. J.
Pell & Dumont, New York (Agent).
Pequanoc Rubber Co., Butler, N. J.
Philadelphia Rubber Works, Philadelphia, Pa.

Reclaimed Rubber — Continued.

Rubber Regenerating Co., Naugatuck, Conn.
Somerset Rubber Reclaiming Works, New Brunswick, N. J.
Stedman Products Co., South Braintree, Mass.
U. S. Rubber Reclaiming Co., Inc., N. Y.
Vulcan Recovery Co., Trenton, N. J.

Red Oxide.

American Oil & Supply Co., Trenton, N. J.
Binney & Smith Co., New York.
Bullock, E. L., & Sons, Inc., New York.
Butcher, L. H., Co., Inc., New York.
Cooper, Charles, & Co., New York.
Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
Industrial Chemical Co., New York.
Innis, Speiden & Co., Inc., New York City.
McNulty, Joseph A., New York.
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Consulting Rubber Engineer.

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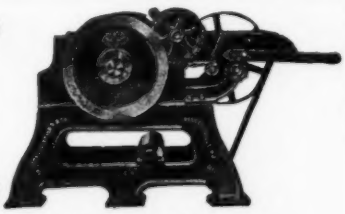

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